

TRANSACTIONS

OF THE

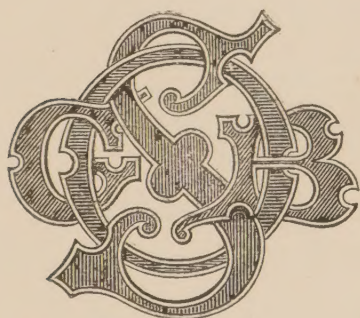
Odontological Society of Great Britain.



VOL. XII.—NEW SERIES.



TRANSACTIONS  
OF THE  
ODONTOLOGICAL SOCIETY  
OF  
GREAT BRITAIN.



VOLUME XII.—NEW SERIES.

LONDON:

Printed and Published for the Society by  
WYMAN & SONS, 74-5, GREAT QUEEN STREET  
LINCOLN'S-INN FIELDS, W.C.

1880.



# List of Officers.

## President.

ALFRED J. WOODHOUSE, ESQ.

## Vice-Presidents.

### RESIDENT.

CHARLES JAMES FOX, ESQ.  
T. A. ROGERS, ESQ.  
J. WALKER, M.D.

### NON-RESIDENT.

DAVID HEPBURN, ESQ. (Edin.).  
ALFRED MEARA, ESQ. (India).  
J. E. ROSE, ESQ. (Liverpool).

## Treasurer.

JAMES PARKINSON, ESQ.

## Librarian.

FELIX WEISS, ESQ.

## Curator.

CHARLES S. TOMES, ESQ.

## Honorary Secretaries.

S. J. HUTCHINSON, ESQ. (Council.) | F. CANTON, ESQ. (Sec.)

A. BARRETT, ESQ.

FOR FOREIGN CORRESPONDENCE.

## Councillors.

### RESIDENT.

E. B. WEST, ESQ.  
J. S. TURNER, ESQ.  
T. UNDERWOOD, ESQ.  
OAKLEY COLES, ESQ.  
W. H. WOODHOUSE, ESQ.  
EDWIN SAUNDERS, ESQ.  
T. C. WHITE, ESQ.  
G. WALLIS, ESQ.  
W. F. HENRY, ESQ.

### NON-RESIDENT.

J. DOHERTY, ESQ. (Dublin).  
W. R. WOOD, ESQ. (Brighton).  
W. HUNT, ESQ. (Yeovil).  
T. W. G. PALMER, ESQ. (Chel-  
tenham).  
T. J. BROWNE MASON, ESQ.  
(Exeter).  
W. WILLIAMSON, ESQ. (Aber-  
deen).



## ORDINARY MONTHLY MEETING,

*November 3rd, 1879.*

EDWIN SAUNDERS, Esq., PRESIDENT, IN THE CHAIR.

---

THE Minutes of the previous Meeting having been read and confirmed,

THE PRESIDENT said he was sorry that the hopes he had held out at the last meeting that the members would hear that evening a paper by Professor Flower could not be fulfilled. He hoped, however, that it was only a pleasure postponed, and that nothing would occur to prevent Professor Flower from reading his paper at the December meeting.

The following gentlemen were then separately balloted for ; they were all unanimously elected :—

ROBERT WALLER, Cairo, Corresponding Member.

CHAS. JAS. NOBLE, L.D.S., R.C.S.E., 1, Drayton Terrace,  
South Kensington, Resident.

THOS. CLEMENTS, 2, Colville Road, Bayswater, Resident.

THE PRESIDENT announced that the following gentlemen had been duly nominated and would be balloted for at the next meeting.

GEORGE WILLIAM PARKINSON, M.R.C.S.E., 36, Sackville Street, London, Resident.

FRANCIS EWBANK, M.R.C.S., L.S.A., Harvard College,  
U.S., 19, Saville Row, Resident.

ADAM TAYLOR, Indian Army, Medical Department, Civil Surgeon, Peshawur, India, Non-resident.

MR. CHAS. TOMES announced that he had received from Mr. Mummary two skulls of Australian blacks which had been sent over by Mr. Ridding, of Sydney, N.S.W., for presentation to the museum. Also that two specimens of gemmated teeth had been presented by Mr. Huet.

MR. COLEMAN then exhibited an odontome which had been sent to him by Mr. Edward Fothergill, of Newcastle, for presentation to the museum. The case had been briefly reported in the June number of the *British Journal of Dental Science* as one of "Cystic disease of the Upper Maxilla," but a more careful examination of the specimen showed it to be what he had stated, an odontome belonging to either the third or fourth of Broca's divisions—he thought it would come under the fourth class—odontomes radiculaires. The patient was a girl, 13 years of age, whose teeth from the left central to the first bicuspid of the same side were absent, whilst the alveolus above this vacant space was bulged out by a firm tumour perforated by several openings through which fetid pus was discharged; by means of a probe the crown of an impacted canine could be distinguished. This was removed with a pair of strong stump forceps, and with it came away a "bony cyst" of considerable size. The patient was of course greatly benefited by the operation.

MR. WOODHOUSE said he had a matter of some importance to bring before the Society. A gentleman (?) had lately called upon him and had commissioned him to make him a set of teeth with gold mounts, and this he had proceeded to do. But fortunately, just before he had parted with his work he learnt that the same man had already obtained sets of teeth, always in gold, from at least four of his neighbours, and had paid none of them. Mr. Woodhouse accordingly declined to supply him with another. As Mr. Woodhouse had not lost anything by the man he had nothing to charge him with, but he hoped that those who had been victimized would combine to prosecute the fellow, in the interest of the profession, and he hoped that those who had not been victimized would be on their guard. The would-be swindler gave the name of Cohen or Cowen; he

was about 50 years of age, of Hebrew physiognomy, had dark-brown hair, a heavy moustache and large eyes. He was dressed in a blue serge suit, and was rather untidy as to his linen.

DR. WALKER said that about seven years ago the same man defrauded a number of dentists in a precisely similar manner. They did combine with the view of taking legal proceedings against him, but were told that as he had given his correct name and address they could not allege that he had made any false pretence, and that all they could do was to bring a civil action against him for the debt.

Casts of Mr. Cohen's mouth were handed round by Mr. Woodhouse, who had obtained them from Messrs. Ash for that purpose.

The following communication was then made by C. S. TOMES, Esq., M.A., F.R.S.

*On Certain Conditions of Dead Teeth.*

THE treatment of dead teeth is, in the hands of most of us, at best uncertain; and although there are to be found practitioners who in all sincerity aver that they obtain perfectly satisfactory results with them, nevertheless when one finds these same persons spending much time and trouble over the confessedly uncertain operations of capping the pulp, &c., one cannot but think that some form of enthusiasm has blunted the dispassionate scientific accuracy of their observing powers. The occurrence of one or two instructive failures in my own practice has suggested that, although I have nothing new to put forward, it would be worth while to take stock of our actual solid knowledge upon the subject, so as to realize what is fact and what is conjecture, and thus have a better standpoint from which to speculate upon the causes of non-success.

The problem is how best to get the organism to tolerate a partially devitalized body in continuity with it. To realize the nature of the problem we may fairly look for light to the structure of healthy teeth, and not in man alone; and also to any fair analogies that can be drawn from other parts of the body.

The most highly-organized parts of the body, those most alive, so to speak, are always protected by being buried away in its interior; external parts, subject to the chances of contact with the outside world, are protected by tissues less fully alive. Thus we are coated over with an epithelium, the deep portions of which are active cells, soft and full of plasm: the superficial layers are horny and all but dead, and as they become quite dead, or perhaps after in their dead condition they have remained a short time adherent, they are shed off. Other instances might be adduced, but this one will suffice to indicate the meaning, which is this: our highly organized live bodies are made fit to encounter the world by being coated with successive layers of less highly organized tissues, till at last in the outermost epithelium we come to something practically dead. This is tolerated because it is gradually led up to, but after all it is not very permanent and is constantly being cast off and renewed. I cannot stop to point out how true it is to say that teeth are but skin appendages; but will simply point out that in their outer epithelial layer, the enamel, they are all but dead; that this nearly dead tissue is brought into continuity with the actively live organism by the intervention (i.) of dentine with its tooth-pulp, and (ii.) cementum with its alveolo-dentar periosteum; in

other words, in the case of a perfect tooth and its surroundings very highly organised tissues are not asked to tolerate in contact with them that which is practically dead, without the intervention of other tissues less highly organised, so as to bridge over the abruptness of the change.

Comparative anatomy furnishes us with countless examples of teeth which have not a cementum with a highly organised periosteum, and in which the pulp (after once the tooth is formed) retains little or no vascularity nor functional activity. Such teeth are, in their entirety, like human enamel, practically dead; but like the similar external layers of epithelium of the skin, they are constantly being cast off and renewed; one might say of them that they were not tolerated long in continuity with the living body.

One of the ways in which dead teeth are lost is by the partial absorption of their roots, which, with coincident demolition of their sockets, leads to their being shed off, like a temporary tooth when its day is done, or like the practically devitalized tooth of the fish or reptile which is, after a brief sojourn, cast off and replaced by a new one.

This, as I shall presently endeavour to show, is one part of the problem: how to prevent a dead tooth from being shed.

It may be said that the argument goes to prove

too much; that, like the absolutely unproved electrical theory of caries recently pressed so far, it provides for the certain destruction of all teeth in question; but this is not quite so. The recent conclusive researches of Heitzmann upon bone, extended by Bödecker to cementum, have shown that there is a protoplasmic network occupying all the canaliculi and lacunæ of living bone and cementum, and that this protoplasmic network entering it from its surface, brings it into an intimate vital connection with the periosteum; in dead bone this has utterly disappeared. This protoplasmic network in the cementum becomes continuous at many points, through channels long since described, with the protoplasmic fibres of the dentine: perhaps this connection may be of much practical significance.

A human tooth is therefore brought into continuity with the rest of the organism by two channels: by its alveolo-dental periosteum covering a great surface, and by its pulp constricted down to one or more small orifices; and these connections seem to bridge over the gap and render living parts tolerant of comparatively dead tissue. That the periosteum alone may be an adequate connection we know from daily experience of dead teeth successfully treated, teeth which have been knocked out and replaced at once, and teeth rendered practically pulpless by calcification of

their pulps, though these are apt to be treated as foreign bodies and cast out by absorption of their roots.

I have recapitulated these anatomical and physiological facts, none of them new, because we need to have them clearly before our minds when considering the causes of failure.

I send round an upper molar which I treated unsuccessfully for weeks, and finally extracted; it exemplifies, in an extreme degree, a condition which I believe to be absolutely hopeless. When it was extracted it was merely rinsed in a basin of water, and never touched since. Everywhere the periosteum had ceased to be adherent to it, and it was, to all intents and purposes, an absolutely foreign body, held in by mere adaptation of its roots to their socket, but without a vestige of organic connection. It was, so to speak, a sequestrum: the protoplasmic network of its cementum was dead and gone, and, unless I mistake, in no way could such a tooth have been retained for any time. Of that tooth I can give you a complete history. Three years ago, though there was no exposure, I placed a little zinc oxychloride in the deepest portion of the cavity, and filled with amalgam over it. All went well for two years, when pulp irritation came on for no apparent reason. Failing to otherwise allay it, I devitalized with arsenic, experiencing some difficulty in doing so,

owing to secondary dentine in the pulp. Contrary to my usual practice, I applied a further application of arsenic after the body of the pulp was dead, when it remained alive only in each of the three roots; the root pulps were afterwards most carefully and thoroughly removed. It was filled with creosote and wool in the roots, was never absolutely comfortable, was opened up and treated repeatedly, and at last, at the patient's desire, there being some neuralgia, extracted, although prior to its removal there was evidence merely of slight irritation in the socket. There was nothing to lead me to infer the complete detachment of the periosteum, and there was never at any time a vestige of pus formed. I am inclined to think that the arsenic may have destroyed not only the pulp, but have reached the protoplasm network of the cementum. Doubtless we may often have to deal with partial death of this protoplasm, and may then sometimes succeed in retaining the tooth; death of the cement protoplasm on any considerable scale I believe to be an absolute bar to success.

I pass round another tooth,—an upper lateral, the end of the root of which is eaten away in the most irregular way. Such teeth are not uncommon, and there is nothing remarkable about it, except that it was quite impossible to diagnose its condition: it looked a favourable case for ordi-

nary treatment, and was extracted purely on account of the patient's inability to attend. Treatment must of course have signally failed, though replantation might have saved it for a year or two, and probably would have done so.

But in this tooth the state of things was very different. Here the apex was the thing affected, and the rest of the cementum with its protoplasm remained practically healthy; and here, so far as it has a point, lies the point of my communication.

I believe that in dealing with dead teeth we have two distinct conditions to combat: the one is abscess at the apex of the root, septic in its origin, and in its results leading, if it has time enough, sometimes to absorption, and sometimes to deposition on the root apices; and the other is general disease of the periosteum, resultant upon disease or death of the cementum.

With apical abscess, taken in hand early, our percentage of success will be very high: when there has been time for change in the hard parts, it will be less complete, and the percentage lower; and here, if anywhere, is the legitimate field for replantation.\*

Where we have a dead or dying cementum

\* In these remarks I am of course speaking only of teeth the roots of which are large enough to enable us to do all that we wish to our satisfaction; I am leaving out of course the failures due to crooked and impervious roots, in other words to imperfect operations.

failure it seems to me is certain. Since I have thought on the matter in this light, two well-marked cases of necrosed cementum are all that I have seen. In each arsenic had been applied more than once, and left several days in the teeth.

There is much room for surmise, and still more for observation upon this matter. We do not know in the least what becomes of the protoplasmic contents of the dentinal tubes when a pulp is removed. Do they decompose and liquify, and, if so, may not their decomposition run on to the cement protoplasm with which they have many communications? Or may not the effect of arsenic travel along them in this direction, as we well know it used to in the other (*i.e.*, towards the pulp) when it was formerly used to allay the sensitiveness of dentine?

If so, we should be very careful to minimise the time of its application, and scrupulously keep it out of roots.

Or, perhaps the dentinal fibrils may not decompose, but may keep up some feeble organic life through their inosculation with the cementum protoplasm. In such a case, should we do well to fill the roots off-hand the moment we have removed the remnant of living nerve from the pulp cavity? For it is not to be forgotten that some years ago many practitioners used to do this,

and even fill with gold, which now we should do, after days or weeks of creosote treatment, with fear and hesitation.

To recapitulate. I believe that in the treatment of dead teeth we have to combat not only the troubles which arise from the escape of septic matter from the apex of the root, which everybody recognises, and in a way understands, but also disease of the alveolo-dental periosteum, induced in some other way, which is less frequent but more intractable. If the surmise that the alveolo-dental periosteum does become diseased in other ways than by the escape of septic material from the apical root canal be true, it is difficult to see by what channel evil influence may approach it other than by the protoplasm of the cementum. This again would hardly be reached except through the medium of the contents of the dentine tubes in the dentine of the root. Such an evil influence may, perhaps, be septic; *i.e.*, the putrefaction of the soft parts of the dentine may poison those of the cementum, and this would seem to be the most likely thing; or the destructive influence of such agent as arsenic may be propagated through the same tissues and bring about similar results in the cementum. In either case we shall have to look to the dentine of the root as the proximate cause of the mischief.

In the absence of adequate positive knowledge,

conjecture may sometimes play a useful part. This must be my apology for my imperfect and inconclusive communication.

I have sometimes employed shellac for filling roots which are so fine as to render it very difficult or impossible to fill them with the materials ordinarily in use.

If it is drawn out into fine threads it is flexible and elastic, and will pass anywhere where the very finest hair bristle will pass; at the same time it is brittle enough to break off readily without withdrawal, and so soon as no more can be introduced by the side of that already in, a drop of spirit running up by capillary attraction fixes it and converts it into a very perfect filling even in very small and curved roots. It possesses this one advantage over all other root-filling materials with which I am practically acquainted: it can be introduced even into the finest root and a perfect filling made without any danger of a piston being formed to force out septic matter from the end of the root.

A little patience and hot instruments will get it out again from a large root, and I have had to thus remove it, but it would be all but impossible to get it out of a very narrow canal, and hence its use is limited to those cases in which one feels tolerably sure of not having irritation follow the filling. This same objection, however, applies

to all perfect fillings in minute roots. I leave wool, of course, out of the question, as it is simply impossible to get it up such roots; but with shellac roots can be perfectly filled which cannot be filled with any other material with which I am acquainted, not excepting gold wire, as the threads of shellac are easily made of a degree of fineness not readily attainable with a very soft gold wire.

## DISCUSSION.

Mr. COLEMAN said it was scarcely possible within the short time allotted to the discussion to do justice to the important points which Mr. Tomes had touched upon. He quite agreed with Mr. Tomes that the difficulty in dealing with so-called "dead" teeth was not so much due to the pressure of septic matter through the apex of the fang as to the tendency of the dentine itself to putrid decomposition. In a paper on "The Treatment of Dead Teeth by Arsenic as an Antiseptic," which he had read before the Society several years since, he had called attention to the fact that an offensive condition of the dentine might be removed by the use of this agent, preventing or correcting the decomposition of the contents of the canaliculi. That arsenic so applied could reach so far as to affect the periosteum of the tooth so treated, he was very disinclined to believe; he had used it in hundreds of cases to cure periodontitis, and had saved the teeth. Moreover, death of the cementum might occur independently of that of the pulp. A gentleman came to him complaining of pain in a tooth which some time previously he had filled with gutta-percha; no cause could be found for the pain, and the tooth was ultimately extracted. The pulp was then found to be quite healthy, but a circumscribed tract of cementum was dead. There was one point on which Mr. Tomes appeared to differ from the conclusions of Messrs. Heitzmann & Bödeker. These observers described a protoplasmic substance as penetrating between the enamel fibres; but Mr. Tomes had spoken of the enamel as dead tissue. He should be glad to hear Mr. Tomes's reasons for his difference of opinion upon this point whilst appearing to agree with these authorities upon others.

Mr. GADDES said that in Mr. Tomes's valuable work on Dental Anatomy there would be found two statements referring

to the contents of the lacunæ and canaliculi of the cementum ; one was that "it is probable that the lacunæ are filled up with soft matrix," and the other that a lacuna "consists of uncalcified matrix, and in this situation lay the nucleus of the cell," thus negating the idea of their containing protoplasm. In reviewing Mr. Tomes's book for the *Monthly Review of Dental Surgery* in January, 1877, Mr. Gaddes took exception to these statements, and the ground of his criticism was that if the lacuna and canaliculi of the cementum did not contain protoplasm, and as they knew of no other channels by which protoplasm could permeate the cementum, then the cementum must be dead tissue. But if it was dead tissue, what was meant by necrosis? How could it die if it contained no living tissue? He inferred from Mr. Tomes's remarks that evening that he had seen reason to alter his views on this point since his book was published, but he would be glad if he would state definitely whether this was the case or not. Mr. Tomes had theorized with reference to the case he had related that the arsenic had penetrated through the dentinal tubules, and had reached and destroyed the protoplasm of the cementum, and that this accounted for the non-success of the treatment. But he (Mr. Gaddes) believed that there were cases on record, though he could not at that moment give a reference to them, in which old dead teeth—teeth which had been lying about the work-room for a considerable time—had been implanted into sockets from which carious teeth had recently been removed and had been retained. Such cases had been recorded in the American periodicals some two or three years ago. He could not vouch for the truth of them, but if they were so it would be necessary to find some other explanation than that suggested by Mr. Tomes of the means by which a "dead" tooth was retained.

Mr. HUTCHINSON said that the fact that in Mr. Tomes's case the pulp was found partially calcified suggested to his mind another explanation for the death of the tooth. In such cases the whole tooth was generally over-calcified ; it was too heavy and too solid in texture ; the protoplasm would thus be reduced in amount and probably also in vitality.

Dr. FIELD remarked that Mr. Tomes had omitted to notice one of the most frequent causes of failure in treating dead teeth. It had happened to him not unfrequently to stop several, perhaps five or six such teeth in one patient, and to save them all, whilst in another patient he might have the same number of failures. Failures frequently arose from systemic conditions which the dentist could not combat. He now used nothing but cotton-wool and creosote for root-stopping ; formerly, when he used gold and gutta-percha, he had many failures, now these were comparatively rare. In an obstinate case he would fill the pulp-cavity with cotton-wool and creosote, and leave it undisturbed for a week ; he usually found the nerve in the root-canal completely devitalized at the end of that time, but if necessary some of the cotton could be passed into the canal on the point of a fine wire. It had never happened to him to have a tooth killed by arsenic, but he knew it might have that effect if it was left in the pulp-cavity for too great a length of time. When he did use arsenic he never left it for more than twelve hours at a time, and had never found more than two applications necessary.

The PRESIDENT having called upon Mr. Tomes to reply,

Mr. TOMES said he was aware that Bödeker described a protoplasmic network in the enamel, but he (Mr. Tomes) believed it to be rather of the nature of connective tissue, and that it could not be differentiated from the network which was to be seen in epithelial tissues elsewhere. Although he had not personally verified all Messrs. Heitzmann & Bödeker's observations, still they seemed to be so well worked out that he did not think there could be any reasonable doubt of their accuracy. He had not intended to assert that the arsenic had travelled through the dentine ; he had only suggested this as a possible explanation. And it was a fact that in former days when arsenic was applied as an anæsthetic to sensitive dentine, death of the pulp did occasionally result. As to the use of shellac, he had not meant to say that it should always be used ; he had found it useful ; fine and tortuous roots along

which a wire could not be made to pass could be filled with this substance without much difficulty.

The PRESIDENT then requested Mr. Hutchinson to give a short account of his recent visit to the United States.

MR. HUTCHINSON said that in response to the very kind remarks of the President, he should have much pleasure in giving a short epitome of what he had seen in America, though he would not venture to take up the time of the Society by any detailed account of his three weeks' tour, for during that period he had traversed a distance of 2,500 miles. Suffice it to say that he had seen all the principal cities of the north-east of America, that he had visited eight of the eleven Dental Colleges, that through the kindness of some American friends in this Society he had introductions to the best-known men in the dental profession there, and that he had received from them the warmest welcome and the greatest kindness. He had not neglected to call at the various depôts so as to be able to bring back any real improvements which had not yet arrived in England, and though he would not attempt to describe all he had seen he thought members would be interested in some instruments which were just being produced by Johnson Brothers. These instruments met a real want, for they were cleanly and pleasant to handle, the nickel plating on the handles could not be spoilt by repointing the instruments, since the bits unscrewed, and could thus be readily tempered and returned to their place or replaced by others. It was of course an old form of instrument, but the combination of the new process with the old idea was, he thought, worthy of notice, whilst the cost was but little increased. The second instrument was only a pattern, and was not yet in the market. It was a mallet designed by Dr. Richmond, giving an elastic and dead blow very like that of the hand mallet; it was extremely simple in its working. Some friends who had seen it privately had complained that the pressure was excessive, but Mr. Hutchinson had put in a weaker spring: he found that he could press the

instrument on a piece of card till the trigger was almost released without marking the paper, but the instant the blow fell the paper received the impress of the point. He could not conclude without saying that he was indebted for this mallet to Dr. Northrop, President of the Odontological Society of New York, who had shown him the greatest kindness, and who, being himself a member of this Society, had most flatteringly honoured it in the person of its Honorary Secretary.

The SECRETARY then read the report of the sub-committee which was appointed twelve months ago to inquire into the nature and application of plastic fillings.

## REPORT OF SUB-COMMITTEE ON PLASTIC FILLINGS.

YOUR Committee, in accordance with their instructions, have placed in the hands of an able chemist samples of Ash's Improved Rock Cement; Fletcher's White Enamel, and Dental Porcelain; Poulson's Mineral Plombe; and Slayton's Cohesive Felt Foil.

The chemist's report of experiments, made in accordance with the instructions of the Committee,\* is as follows :—

### *Chemical Examination of Dental Cements.*

I. *Fletcher's Dental Porcelain, mixed of consistency convenient for use, and kept dry till it was set.*—The analysis of this sample showed it to be essentially pyrophosphate of zinc; it is not, however, a perfect chemical compound, but, in the case examined, a compound of the acid with the oxide of zinc containing a slight excess of oxide of zinc.

The samples also contain a small quantity of insoluble matter which is evidently silica.

\* Mr. Thomson was requested by the Committee to ascertain whether the fillings when mixed formed true chemical compounds or mere mixtures, and to experiment upon their power of resistance to weak acids.

II. This sample had been immersed in water as soon as mixed. The analysis showed that its composition was essentially the same as I., pyrophosphate of zinc, but it contained a less excess of zinc oxide; probably this had been removed on the first immersion in water. No further solvent action, however, seemed to take place with cold water on again subjecting it to that body.

III. *Poulson's Cement*.—This cement, upon analysis, gave very good results, showing it to be pyrophosphate of zinc and a small quantity of silica. It contains, like the others, a slight excess of oxide of zinc, but in much smaller quantities than in the samples of Fletcher's cements.

IV. This cement, which was placed in water as soon as mixed, had very nearly the same composition as III.

All these samples had small and differing quantities of water in their composition.

V. *Fletcher's Dental Porcelain, mixed as thickly as it could possibly be used*.—This sample consisted of zinc oxide and phosphoric acid, but containing a *very much larger quantity of zinc oxide* than would balance the phosphoric acid. It presented no evidence of being a true chemical compound in its entirety, but might be regarded as zinc pyrophosphate, associated with a large excess of oxide.

VI. *Fletcher's Dental Porcelain, of convenient thickness*.—This was found to be essentially zinc pyrophosphate, with a very slight excess of the oxide, also associated with some combined water.

VII. *Fletcher's Dental Porcelain, mixed very soft*.—Resembled VI. to a certain extent, but contained a much larger quantity of phosphoric acid and water.

VIII. *Fletcher's Dry Chloride of Zinc (White Enamel)*.—This cement gave numbers which, after deducting the water and insoluble matter, show it to be an oxychloride of zinc.

IX. *Ash's Rock Cement*.—This body does not give such good results as V. The sample examined might be regarded, however, as an oxychloride of zinc and silica, containing an excess of oxide of zinc, of which it contains more than the cement V.

Of these cements, VI. most closely resembles a chemical compound, and quantities something between those contained by V. and VI. would represent such a compound.

All the specimens examined must be regarded as compounds, plus a greater or less quantity of either constituent uncombined.

#### *Action of Acids upon the Cements.*

The different samples of cements were individually subjected to the action of dilute solutions

of the following acids:—Acetic, tartaric, citric, and malic.

The cements were subjected to the action of the same quantity of acids in each case, and for the same amount of time to render the cases as far as possible identical.

The strength of acid used was in each case  $\cdot 001$  grammes of acid in 100 CC. of water.

From these experiments it was found that cements I. and III. were very little acted upon; but the cements VIII. and IX. were acted upon to a greater extent.

Of the cements V., VI., and VII., the one least acted on was VI.

The action of the dilute acids took place soon after immersion, and the action was less and less on a second and third immersion. I attribute this to the acid removing the excess of uncombined oxide that the cements contained; and after that is removed, it does not act upon the nearly true compound that is left.

J. M. THOMSON, F.C.S.,

Demonstrator of Chemistry, King's College, London.

In addition to this, the members of the Committee have themselves experimented upon several of those substances. In recording the results of their experiments they think it necessary to add that, although the experiments were made with

care, and by each of them, they do not afford a basis upon which to form any positive conclusions. The experiments must therefore, be taken rather as suggestive than as conclusive. Most of the fillings were tested by plugs inserted in freshly-extracted teeth, or in glass tubes, and their power of forming a water-tight plug examined by immersion in Draper's dichroïc ink. Some were protected till set, others exposed while yet soft to the action of water.

*Ash's Rock Cement* made water-tight plugs, there being no staining after five weeks' immersion in Draper's dichroïc ink; though one plug in a glass tube, which was kept dry, was loose.

The surface of several plugs was cracked, yet there was less loss of substance by the action of the ink than there was in the cases of plugs made of Poulson's Mineral Plombe when similarly treated.

There was no adhesion to a flat surface of ivory with the saw-cuts left upon it.

*Fletcher's White Enamel*.—One plug showed slight leakage; and also one plug made in a glass tube was loose. Other fillings, under similar circumstances, showed apparently neither contraction nor wasting.

There was slight adhesion to a flat surface of ivory with the saw-cuts left upon it.

*Poulson's Mineral Plombe.*—In Draper's ink the plugs lost substance, and were stained to a considerable depth, showing the porosity of the substance. Three plugs admitted slight penetration of the ink along the walls of the cavities; one was a failure. In the mouth, four out of twelve plugs showed waste, and the cavities which reached to the gum were not full after six months. Two cavities in one mouth were filled, one wet, the other dry; the wet one deteriorated. One plug immersed in water just after having been made lost much of its surface, and was very rough, but water-tight, as other plugs were.

There was good adhesion to a flat surface of ivory.

*Slayton's Cohesive Felt Foil.*—Some fillings in the mouth had worn a little, but stood well, and one had proved water-tight six months after its insertion in the mouth. When packed under water the plugs, when removed, could be picked to pieces with the finger-nail, but a more perfect filling was made when packed dry. When capped with adhesive gold there was no evidence of amalgamation with the gold, but there was a distinct amalgamation with non-adhesive gold packed upon it.

The Committee would, in conclusion, submit that the only method of ascertaining the perma-

nent value of plastic fillings is by watching their behaviour in the mouth; experiments out of the mouth serving merely as indications by which to render more intelligent our observations in actual practice.

For example, the results of chemical analysis show that we should probably be wrong in endeavouring to mix Fletcher's Dental Porcelain very thick; for its most complete chemical compound would lie between V. and VI.

They would further add, that their individual experience leads them to expect successful results from the pyrophosphate rather than from the oxychloride fillings.

Signed,

CHARLES S. TOMES,  
S. J. HUTCHINSON,  
THOMAS GADDES,  
ROBERT H. WOODHOUSE.

The PRESIDENT then proposed a vote of thanks to Mr. Tomes, and to the other contributors that evening, and also to the members of the sub-committee for their valuable report.

This having been carried unanimously, the meeting terminated.





WILLIAM W. BENTLEY, F.R.S., F.R.A.S., F.R.S.E., F.R.S.





## ORDINARY MONTHLY MEETING,

*Monday, December 1st, 1879.*

EDWIN SAUNDERS, Esq., PRESIDENT, IN THE CHAIR.

---

THE Minutes of the previous Meeting having been read and confirmed,

Messrs. EDWARD G. BETTS and THOMAS CLEMENTS signed the Obligation Book and were formally admitted to Membership by the President.

The PRESIDENT announced that the following candidates had been duly nominated and would be balloted for at a subsequent meeting, viz. :—

BAXTER VISECK, 41, Brook Street. Resident.

FRANK ALEXANDER HUET, L.D.S. Ireland, 120, Oxford Street, Manchester. Non-Resident.

MARTIN HENRY, L.D.S., R.C.S.E., 25, Cheriton Place, Folkestone. Non-Resident.

MORTON ALFRED SMALE, M.R.C.S., L.S.A., L.D.S. Eng., 165, Edgware Road, W. Resident.

W. ST. GEORGE ELLIOTT, M.D., D.D.S.U.S., 39, Upper Brook Street. Resident.

HERBERT POATE, D.D.S. Pennsylvania, 13A, Promenade, Cheltenham. Non-Resident.

JAMES LEE FRANCIS JOHN PIKE, L.D.S. Eng., 2, Irving Street, Dumfries, N.B. Non-Resident.

W. H. THOMPSON, M.D., D.D.S.U.S., 41, Brook Street. Resident.

The following candidates were then separately balloted for and elected Members of the Society :—

GEORGE WILLIAM PARKINSON, M.R.C.S.E., 36, Sackville Street, London, Resident.

FRANCIS EWBANK, M.R.C.S., L.S.A., Harvard College, U.S., 19, Savile Row, Resident.

ADAM TAYLOR, Indian Army, Medical Department, Civil Surgeon, Peshawur, India, Non-resident.

CHARLES FORAN, Marshfield House, Eastbourne, Sussex.

Mr. CANTON related a remarkable case as follows :—

Mr. PRESIDENT and GENTLEMEN—

The case I have to bring before this Society is of such rare occurrence that perhaps you will excuse me if I enter rather fully into details.

On the 6th December, 1878, a gentleman called and requested me to attend his wife at his residence, as she had for some time past complained of difficulty in swallowing, produced by artificial teeth. On examining the patient's mouth, I found the tongue raised considerably upwards and backwards by a mass of mucous tissues almost as large as the tongue itself, and giving very much the appearance of a second tongue, that is to say, one under the other, only the lower being shapeless ; on examining further I found the patient wearing a complete upper plate of gold and vulcanite with springs ; these springs I found attached to a lower gold plate on which was one molar tooth on each side, but I could not see nor could I feel any bar of gold or other material connecting the two teeth. I must mention that owing to this enormous mass of tissues, it was almost impossible to see anything whatever ; however, in trying to raise the lower plate, I found I could not do so, and on a still closer examination I discovered that the whole of the gold bar which usually rests against the back of the front teeth was entirely buried and grown over by a firm fibrous band of tissues. I asked my patient a few questions, and found she had not had her plates out of her mouth for *five*

*years*, and that the difficulty in swallowing had gradually increased for a long time. I then told her I should be obliged to cut the lower plate out, and left to get the necessary instruments.

The same afternoon I called, accompanied by Mr. Willis to assist me. I first cut both springs through close to the lower swivels, and so removed the upper plate in order to get as much room as possible. Mr. Willis then held one end of the lower plate firmly by the swivel-head with a pair of pliers, while I endeavoured to cut through the fibrous bands with a straight bistoury, meaning to cut on the gold bar itself for safety ; but this I found I could not do, my knife having a great tendency to slip, and it being very difficult to keep the bulging mass of mucous tissues out of the way. I then took a curved bistoury, and with that succeeded in cutting by degrees through the band, Mr. Willis keeping the plate firmly raised the whole time, and so to say following me up each cut I gave.

The fibrous nature of the band was clear, from the firmness with which the plate was bound down, and also from the peculiar sound produced each time the knife was used ; I should say that this band was quite one-eighth of an inch in thickness, and extended from the right molar to left molar teeth. I remained with my patient some time to see that no hæmorrhage occurred, and after prescribing a little carbolic acid and liq. potassæ, as a mouth-wash, left.

Everything went on well until the 9th of December (three days after the plate was cut out), when my patient complained of the last lower tooth on each side cutting her tongue and causing pain in swallowing. As these were both mere shells with very rough edges, I removed them, and from that time everything was satisfactory.

On the 18th December I put in a new upper suction plate of celluloid, but I advised her not to wear any lower piece for a long time, not until all the abnormal growth of tissues had subsided, which I should say would take many months.

I saw this lady's husband about two months ago and he then said she was perfectly comfortable, but as I have not seen her

recently myself, I cannot say whether the parts have assumed their normal character or not.

What strikes one as being so marvellous and which makes these cases so rare, is, that anyone can be found who could endure the pain that must occur. We know how painful even a small ulcer is; but in this case, the whole gold bar must have ulcerated right under the tongue and then the two ulcerated surfaces united. Yet I could not get my patient to admit that she had suffered any extraordinary pain.

There is only one other case that I know of similar to this, and that occurred in Mr. Turner's practice; I think Mr. Moon also has seen a case something similar.

DR. WALKER then related the following case:—

A young lady, aged sixteen, came to him complaining of dental irritation and difficulties in mastication. On examining her mouth he found that she had ten temporary teeth in the upper and the same number in the lower jaw, still in situ, movable, with large interspaces; only two permanent lower molars erupted. Dr. Walker extracted the loose temporary teeth and all symptoms of irritation at once subsided; he had since articulated an upper and lower denture. The patient, though well formed in every other respect, had badly-developed jaws, which gave a childish expression to the lower part of her face. He was informed that her brother, who was two years her senior, had only two six-year old molars in the lower jaw and no permanent teeth in the upper. He thought that the occurrence of two such cases in one family was so rare as to be worthy of record in the Society's Transactions.

The PRESIDENT remarked that though cases in which certain of the permanent teeth were deficient were not very uncommon, cases in which all, or nearly all, were wanting were so very rare as quite to deserve mention whenever met with.

MR. VANDERPANT showed a first lower molar with a considerable exostosis on the root which he had removed from the

mouth of a gentleman, between sixty and seventy years of age ; the tooth had been stopped by Mr. Bell forty years ago.

Mr. Vanderpant also exhibited and presented to the museum a curious old bone-plate which had served its late owner for a great many years.

MR. HUTCHINSON showed, for Mr. Farnham, of Ipswich, a curiously-deformed wisdom tooth ; growing from the root low down was a supplementary cusp, covered with enamel and resembling a bicuspid or first temporary molar. Several unsuccessful attempts at extraction had been made before the patient applied to Mr. Farnham.

He also showed some useful "chucks" for lathes which had been sent by Mr. Richardson, of Derby. They screwed on to the mandril and were adapted for carrying sand-paper, buff sticks, cane for pumice, and various other adjustments. The most useful seemed to be the arrangement for corundum wheels ; this ended in a tapered, square mandril on which could be fitted true in a moment any corundum wheel having a brass centre-piece imbedded exactly in the centre.

Mr. Hutchinson then showed, in a book which had been kindly lent by Dr. Birdwood, C.S.I., of the India Office, a photograph of a Hindoo bas-relief, representing a group of monkeys engaged in extracting a man's tooth. The unfortunate individual was bound and the tooth was held in the grasp of a very primitive-looking extracting instrument, to which a small elephant was attached by means of tackles. This piece of sculpture was found in a ruined temple near Allahabad, known as the Stupa of Bharhut, and was more than 2,000 years old, the temple having been built about the year 300 B.C.

The PRESIDENT then called upon Professor W. H. Flower to read his paper.

*Notes on the Specimens of Abnormal Dentition in  
the Museum of the Royal College of Surgeons.*

By WILLIAM HENRY FLOWER, LL.D., F.R.S.,  
Honorary Member of the Odontological  
Society.

AN urgent request from our President, and my desire to signify, in however humble a manner, my appreciation of the efforts made by this Society to promote the scientific consideration of subjects connected with the profession to which most of us belong, have induced me to bring before you this evening some notes upon a subject which has already specially engaged the attention of several of the ablest of our members, on which a very complete treatise has lately been published in France by M. Magitot, and which those who practise dental surgery have most ample opportunities of investigating. Under these circumstances, I fear that I shall not be able to bring much that is new before the Society relating to it. I can only hope to add a few more records of facts to those already accumulated; the principal interest of which, if there be any, lies in the circumstance that a considerable number of skulls of

racés of men living in a state of civilization less artificial than our own, and therefore less prone to irregularities, have passed under review. The whole collection consists of about 1100 crania, in examining which for the purpose of drawing up a catalogue, I have noted any marked deviations from the normal condition. I have also added some singular examples from the lower animals where such exceptional conditions are still more rare; and I trust that the inspection of the specimens which I have brought before the meeting will prove of interest to the members present.

The cases in the human species may be grouped as follows:—

A. Irregularities as to the number of the teeth.

a. Excess of the normal number. Of these there are five examples in the collection.

No. 327,\* is the skull of an adult Englishman, dug up near St. Michael's Church, St. Alban's. It has in the upper jaw a pair of supernumerary incisors, placed immediately behind the normal upper incisors. They are full sized, but of rather irregular form, and placed as it were back to back, what should be their labial surfaces being turned outwards. Their roots are immediately

\* The numbers refer to the Catalogue of the specimens illustrating the Osteology and Dentition of the Vertebrated Animals, recent and extinct, in the Museum of the Royal College of Surgeons of England. Part I, Man., 1879.

behind the central normal incisors, but their apices are directed outwards, so as to be behind those of the lateral incisors. They have been worn at the points nearly as much as the normal teeth.

No. 715, is a male Japanese cranium, with a small supernumerary upper incisor on the right side close to the median line, and behind the normal teeth.

No. 1243, a fine skull of a male West African Negro, with a beautiful and regular set of teeth, but with a small conical supernumerary placed between the right upper lateral incisor and the canine, ranging with the normal series.

No. 636, a male Hindoo, with two upper canines, apparently well-developed and of characteristic form, in the dental arch on the right side. This is a condition that Magitot declares never to have been met with, and although there is no doubt about the existence of two teeth in distinct sockets, there are appearances which indicate the possibility of the substitution of a normal canine for a supernumerary which has been lost.

No. 1086, a male Australian, in which on the outer side of the third upper left molar (which is still below the level of the alveolus), was a small supplemental tooth (now lost) in a distinct compartment of the bone.

b. Deficiency in number. Irregularities of this

class are not always so easy to determine as those of the last, as cases in which a tooth has appeared and been lost may be mistaken for those in which it is altogether absent from the series.

There is no example of the case, said to be so frequently met with in dental practice, of absence of both upper lateral incisors. The nearest approach to it is No. 1043, an Australian female, in whom the upper left lateral incisor is wanting, the canine being in close contact with the median incisor, and the right lateral (now lost) must have been, as shown by the socket, of very small size.

There are four interesting specimens, closely resembling each other, of the presence of only three incisors in the lower jaw, which have spaced themselves quite regularly, the central one being exactly in or very near the middle line. In No. 1111, a Tasmanian, these teeth are remarkably symmetrical, one quite in the middle line of the jaw and with the crown squared at the corners, and flanked on either side by two others which have the outer corners rounded off, as in the ordinary lateral lower incisors. No. 1106, also a Tasmanian, is very similar. In these cases it appears that one of the central incisors has not been developed. In No. 767, a New Zealander, on the other hand, it is clearly the left lateral that is absent; and in No. 1164, a native of Cherry Island, in the West Pacific, the missing

tooth appears to be the right lateral. Deficiencies of the last molars have not been counted, as the subject has lately received such a large amount of special treatment.

*B.* Retention of permanent teeth within the alveolus. This condition, which is usually accompanied by some misdirection of growth, forms one of the most numerous classes of abnormality. An interesting feature in these cases physiologically, is the very frequent persistence throughout life, or at all events to adult age, of the corresponding milk-teeth. Indeed it is sometimes only by the presence of such a tooth that the position of the permanent tooth has been detected. Such cases give support to the view advocated by Tomes, that the retention of the milk-tooth in its place is a common cause of the retardation of eruption or misdirection of growth in the permanent tooth. They also seem to show that in some cases, at least, the absorption of the root and consequent fall of the milk-tooth, requires the mechanical pressure of its successor to bring it about. At all events, however difficult it may be to determine which is the cause and which the consequence, there is undoubtedly, as a general rule, a close relationship or interdependence between the fall of the milk-tooth and the eruption of its successor.

Retention in the alveolus happens far more frequently to the canines than to any other teeth; a

fact which Magitot attributes to the late development of these teeth, and their not coming into place until those around them are already established in position.

*a.* Affecting the incisor teeth.

No. 928, a Peruvian adult male. The right lateral upper incisor is retained in the alveolus.

*b.* Affecting the canine teeth. Of these the Museum contains an interesting series of specimens, formerly belonging to the late Mr. Walter Jones, of Worcester, and described by Mr. James A. Salter, in *Guy's Hospital Reports*, 3rd Series, vol. v. (1859).

No. 283, the left superior canine embedded in the palate, behind the incisor teeth, with its apex close to the incisive foramen.

No. 284, the left upper canine completely concealed in the palate behind the incisors, and the milk-canine permanently retained.

No. 285, a remarkable specimen of the superior maxilla of an old person, with both canines directed almost horizontally inwards and forwards within the alveolar arch, so that their apices meet at the middle line. With the exception of two molars and a premolar on the left side, and one molar on the right, there were no other teeth in the jaw at the time of the person's decease. The crowns of the canines occupy all the space in which the incisors are usually implanted. This closely resembles

a specimen figured in Tomes' "Dental Surgery" (1859), p. 187.

No. 286, the right milk-canine permanently retained in its place, its successor lying obliquely in the alveolus, the crown being situated in front of the roots of the two right incisors. Besides these in the general series, are Nos. 279, 280, 281, 282, 317, 505, 515, 517, of upper canines retained in Europeans, No. 620, in a Syrian, and No. 1202 in a native of the Andaman Islands. In No. 515, an Italian female, both permanent upper canines are partially embedded in the palate, and the milk canines occupy their places in the dental arch, although the basilar suture is united, and the third molars are coming into place.

Perhaps in this category should be placed a remarkable case of a skull, No. 278 (said to be that of a Negress), part of the original Hunterian collection, in which the crown of the right upper canine projects upwards forwards and inwards into the right nostril, its apex reaching as far as the septum nasi.

And also No. 1164, the skull of a native of Cherry Island, in the Western Pacific (the same in which only three incisors are present in the lower jaw), in which the right upper canine is almost completely embedded in the maxilla, the apex of its crown projecting upwards and outwards just below the infra-orbital foramen, with its lingual surface turned forwards.

In both of them, owing to some early alteration of the position of the pulp, the tooth has grown in a direction almost opposite to that which is normal.

There is but one example of the retention of a lower canine,—an Anglo-Saxon, No. 317; but it must be recollected, that lower jaws are not so numerous in the collection as crania.

*c.* The retention of the premolars appears to be less frequent.

One of Mr. Jones's specimens, No. 287, is a curious example of the lower jaw of an adult, in which the posterior premolars of both sides are permanently retained in the alveolus, and placed obliquely, with the crowns directed forwards against the roots of the teeth in front. There are vacant spaces in the jaws where their crowns ought to be.

In the following cases milk-molars have been retained to adult age, with retention or want of development of the premolar which ought to succeed.

No. 504. An Italian male. Though all the true molars are in place, the second lower left milk-molar is retained and occupies the place of the permanent premolar, which appears not to be developed; at all events an opening made into the alveolar wall shows no trace of its presence in the situation where it might be expected.

No. 515. An Italian female. The basilar suture is

united and the wisdom-teeth are coming into place. The posterior lower right milk-molar is retained, but its roots are nearly absorbed, and its successor appears ready to take its place. This is the same specimen previously referred to as having the retarded canines. It has also an inferior incisor with bifurcated root.

No. 714, a male Japanese. Though the basilar suture is closed, and the skull shows every sign of maturity, there are no molars behind the first in either jaw, nor any appearance of their having been lost, and the first upper milk-molar is in place on the right side.

No. 1086, an Australian female. Although that of an adult (the basilar suture being closed, and the right third molar fully in place), both posterior milk-molars are retained, with no appearance of absorption of their roots. The premolars, which should succeed them, are fully developed, but are concealed and obliquely placed within the alveolus.

*C.* The cases to be considered next are those of abnormal position of individual teeth, which have attained their full development. The slight cases, which of course are very frequent, will not be noticed.

Of what is called transposition or change of place between two teeth, I have not observed any instance.

In No. 280, an English jaw, the right lateral

incisor is placed altogether behind the others and rotated on its axis.

Although in most of the lower races the teeth are regularly placed, among the diminutive Andamanese crowding of the lower incisors is very common, and in two specimens the lower canines are both rotated on their axis so that their labial surfaces face directly inwards, and are in contact with the lateral incisors.

In No. 434, an Italian, the right upper premolars are both misplaced, being side by side and rotated on their axes.

In No. 505, also an Italian, the right upper premolar is displaced inwards and rotated.

In No. 1292, a male Kaffir, the first right upper premolar is completely displaced inwards, the canine and second premolar coming in contact.

Irregularities of position of the true molars appear to be rare, except in the case of the wisdom-teeth, which, however, for the reason assigned above, I need only allude to here, to point out a remarkable exception to the general rule that in the negroid races these teeth are constant in appearance and regular in position and development.

This exception is the very interesting race constituting the aboriginal inhabitants of Tasmania, now extinct, and of which unfortunately very few remains have been preserved. Among

the series of skulls of this race in the museum of the College of Surgeons, the largest collection at present existing, the frequency of defective development, shown in a peculiarly corrugated condition of the surface of the crown, irregular position, and tardy eruption of these teeth, is very remarkable. In some of the skulls in the collection the teeth are lost, in others the mandible is absent, so that there only remain thirty-three cases of wisdom-teeth observable in adult crania. Of these eight only are in what may be called a normal condition, though of these two are of small size, and one carious, an exceedingly rare circumstance in the race. In seven the tooth is absent, having been either lost or not developed, all the other teeth being present. Two are in place, but misshaped. In sixteen, errors of position occur, the teeth being either below the level of the alveolus or tilted outwards in the upper jaw or forwards in the lower jaw, being often at the same time of irregular form.

It should be noted that it appears to be the rule in Negroes, Melanesians, and Australians, that the third molars are in place *before* the closure of the basilar suture; and that out of a series of nearly sixty Australians so nearly allied in many respects to the Tasmanians, there is not a single case of malposition of the third molars, and only one in which these teeth are abnormally small.

Among the Melanesians of the Eastern Pacific, still nearer in physical character to the Tasmanians, having similar frizzly hair, this deformity is almost equally rare; but there is one instance, No. 1114, from the Isle of Pines of the, crowns of the posterior upper molars being turned directly outwards.

Defective condition of the wisdom-teeth is therefore no monopoly of the most highly-civilized races, but may also be found among the most abject and degraded of the whole human species.

In some of the Mongolian races, notably the Eskimo, the wisdom-teeth are frequently wanting.

*Specimens among other Animals.*

One of the commonest causes of anomaly in the dentition of animals arises from the over-growth of such teeth as have persistent pulps, when the natural wear at the extremity which keeps them in proper form is interfered with. Of this there are numerous instances in the museum, especially among Rodents, and also one in the Rodent-toothed Lemur, *Chiromys*, and a very remarkable case of the lower jaw of a boar, which was figured by the great anatomist Chiselden, in his "Osteographia," published in 1733, and is thus described in Prof. Owen's Catalogue: "It shows the effect of the unchecked growth of the lower canines through some defect of the upper ones.

The points of both the lower canines following the curve impressed upon them by the shape of the socket, have re-entered the mouth, piercing the integument and the substance of the jaw itself, the apex of the right tusk projecting forwards on the inner side of the base of the same tusk, whilst the apex of the left tusk presses against the more advanced extremity of the right tusk, where it is buried in the substance of the bone."

These specimens can scarcely be considered as teratological or abnormal, in the sense in which we have previously used the word, but rather cases of natural growth, modified or perverted by abnormal conditions.

The anomalies of number or position are far more rare.

Of examples of excess above the usual number, I can only adduce one, in a common seal (*Phoca vitulina*), No. 3963 G, which has a small molar in addition to the usual number of five, behind the last on the left side of the upper jaw, and another one on the inner side of the fifth in the lower jaw, also on the left side, and being quite a miniature representation of the ordinary molar teeth.

Abnormal position is illustrated in a fine adult male Orang (*Simia satyrus*), No. 5053 B, with the upper left canine placed too far back, and in contact with the second premolar, displacing the first premolar inwards. When the jaws are closed, the

upper canine shuts behind the first lower premolar.

No. 5017 A, is a Vervet Monkey (*Cercopithecus lalandii*), with the lower canines both directed so far backwards that instead of shutting in front of the upper, they lie within, and are altogether concealed by them. Their apices fit into cavities formed in the alveolar border, at the inner and posterior edge of the upper canines. The defect is quite symmetrical, and all the other teeth are in normal opposition.

A curious instance of abnormal position of teeth induced by selective breeding, and perpetuating itself by heredity, is seen in the case of the bulldog, in which as the teeth have not diminished in size or number to accommodate themselves to the diminished length of the upper jaw, one or more of the upper premolars, instead of being placed with its long axis in the antero-posterior direction, as in all other dogs, is placed obliquely, or often quite transversely in the jaw.

Lastly, I would direct the attention of the members of the Society to some singular anomalies occurring in the tusks of the elephant. The first (No. 399, Teratological Series), that of a double trunk, is truly teratological, and must arise in a bifid condition of the pulp. It cannot be a union of two teeth, however much it may look like it; nor can this, or in fact any other, of the anoma-

lies of which I have spoken, be explained on the principle of reversion to an ancestral type. It is simply a case of monstrosity, the origin of which is at present perfectly obscure.

The next set of cases, that of spirally-grown tusks, of which there are three examples in the museum, appear to be of pathological origin, although the result is a very singular one. In all of them there is a defect of growth of ivory on the inner side of the spiral curve, apparently owing to an imperfect condition, either from disease or injury, of the pulp, limited to one spot, and persisting during the whole growth of the tusk. The growth being retarded at this spot, and more rapid elsewhere, has resulted in the spiral form.

No. 2757. This specimen is perhaps the oldest dental or osteological specimen preserved in any museum in the country the history of which can be traced. Two hundred years ago it formed part of the collection belonging to the Royal Society. When this was broken up it found its way to the British Museum; and again, in the early part of the present century, it was transferred, with other osteological specimens, to the College of Surgeons. It is figured and described in Grew's "*Museum Regalis Societatis*," 1681, p. 31, as "a spiral or wreathed tusk of an elephant. Presented from the Royal African Company, by Thomas Crispe, Esq. It is twisted or wreathed from the bottom to the

top, with three circumvolutions standing between two straight lines. 'Tis also furrrow'd by the length. Yet the furrows surround it not, as in the horn of the Sea Unicorn; but run parallel therewith. Neither is it round, as the said horn, but somewhat flat. The top is very blunt." Fig. tab. 4.

The second specimen of the same kind, No. 2756, also from the British Museum collection, is of smaller size, and more open spiral curve; and the third, No. 2757 A, recently received from the Gaboon, is interesting as showing, that as the disease which produced the defective growth increased in intensity, the curvature became greater, until when half the side of the tusk was affected the tooth was growing in a circle instead of a spiral, then the growth was altogether arrested, and the tusk probably dropped out of the socket.

## DISCUSSION.

The PRESIDENT said that after the paper they had heard he felt sure that the members would be as much obliged to him for his temerity in calling upon Professor Flower, as they were to that gentleman for having found time amongst his numerous engagements to comply with such a request. He thanked Professor Flower in the name of the Society for the honour he had conferred upon it. With regard to the subject in hand, his experience was that irregularities of excess were more common than those of deficiency. He knew one gentleman who had five incisors in the upper jaw, all well-formed and regular, so that there was no obvious deformity. Another had only two incisors in the lower jaw, but these were unusually large.

Mr. CHAS. TOMES said he need not refer to the numerous specimens of abnormal dentition contained in their own museum, since those who cared to do so could examine them for themselves whenever they chose. He had seen some very curious examples also in other museums; one of the most remarkable was at Boston, a case of malposition of one of the upper canines. It was found lying in the nasal process of the superior maxilla, its crown being close to the lacrymal duct. Professor Flower had spoken of the peculiar jaw of the bulldog as being an accidental deformity which had been carefully intensified and rendered permanent by breeding. He had in his own family a dog which had exactly the opposite deformity: its upper incisors and canines were far in advance of the lower; yet its three or four immediate ancestors presented no peculiarity of the jaws. It was a good example of an accidental deformity suddenly appearing, and no doubt it might be rendered permanent were it worth while to do so. With regard to the stunted wisdom-teeth of the Tasmanians; since in their case this could not be a mark of civilization, it might

be due to another cause, viz., premature arrest of the growth of the jaws. Stunted teeth were frequently associated with deficiency of room. Any cause which cut short the backward elongation of the jaw would tend to produce also imperfectly developed wisdom-teeth. This result did not always follow, but it did usually, and possibly the explanation of this curious exception to the general rule, that defective wisdom-teeth were associated with high civilization, might be found if looked for in this direction.

Dr. WALKER quoted Professor Flower's statement, "That suppression of the canine teeth was more common than the suppression of the incisors," in the maxillary bones of the inhabitants of England, so far as his experience guided him. As an exception to this rule he would give the history of a case that occurred in his practice: A gentleman between fifty and sixty erupted his two central incisors after he had attained fifty. For many years he had worn, with every appearance of comfort, an upper and lower denture with perfect masticating power; in the eruption of each central the dentures became so displaced that he was obliged to seek assistance in extraction; the central teeth were found to be perfect in formation, although slightly more horn-like in colour, and comfort in the wear of the dentures was again established. The suppressed eruption of one or both of the canine teeth he had seen several cases of in practice, some more worthy of notice as to position than others. In one case the left canine had assumed a position the entire length of the palate arch, the crown only covered by mucous membrane lying behind the lateral incisor.

Mr. COLEMAN said he knew it was the general opinion that the wisdom-teeth were becoming obsolete. There was no doubt that they were often imperfectly developed, especially those in the upper jaw, but he thought that many of the cases in which these teeth were said to be absent were really cases in which the first molar had been removed at an early age. The patient looking upon this as a temporary tooth, mistook the wisdom-tooth for his second permanent molar, and thought that the

third molar had failed to appear. But on looking into the patient's mouth a slight irregularity in the dental arch might generally be seen between what appeared to be the first molar and the second bicuspid ; and on more careful inspection it would be seen that the first molar had been removed.

Mr. HENRY related an interesting case of a canine first showing itself at ninety years of age. The old lady was wearing a denture at the time. He asked Professor Flower if he knew of any means of ascertaining, when teeth were thus *apparently* absent, whether they were only unerupted or were really missing?

Mr. VASEY said he agreed with Mr. Coleman that in many cases in which the wisdom-teeth were thought to be absent, the first molars had been removed at an early age and then the third molars were mistaken for the second. This mistake was the more likely, since under these circumstances the third molars were generally better developed than usual and made their appearance earlier—they might come through at fifteen or sixteen years of age. The tooth might then be readily taken for a retarded twelve-year-old molar instead of an accelerated wisdom-tooth.

Mr. DENNANT said an instructive case had occurred in his practice a few years back. A lady came to him and begged him to extract her left lower first molar ; she said she had suffered from neuralgia for months and could bear it no longer. The tooth had been soundly stopped with gold, there was no tenderness on percussion, or excessive sensitiveness of any sort, and on inquiring more carefully about the neuralgia he found that the patient had great pain during deglutition. The lady was twenty-eight years of age, and the left lower wisdom-tooth had not appeared. Mr. Dennant advised that the first molar should not be interfered with, but that the second, a perfectly sound tooth, should be extracted. This was done, and the patient had no return of the pain.

Mr. HUTCHINSON said Professor Flower had remarked that

in savage races, as in civilized ones, when a permanent tooth was retained in the alveolus, the corresponding temporary tooth generally persisted. Did he think that this persistence of the temporary tooth was the *cause* of the non-appearance of its successor or only the result of it? The answer to this question was of great importance as a guide to treatment. For instance, in the case of a patient aged twenty-five, with unerupted permanent and persistent temporary canines, would it be best to extract the temporary teeth or to leave them?

Mr. MUMMERY said he knew of a clergyman who had an extra incisor in the lower jaw; it was quite central and regular in appearance. Some years ago he had an opportunity of examining the jaws of a large number of African negroes. He met with five individuals—Ashantees—who had a fourth molar in the upper jaw; in two cases the extra tooth was present on both sides, in the other three on one side only. He did not meet with a single instance of a fourth molar in the lower jaw. With regard to the connection between imperfect development of the wisdom-teeth and a high degree of intellectual culture, he had examined a large number of persons belonging to the agricultural classes, and found that in them the molar was generally far better developed than in the more highly-educated classes of the community. He thought that the form which should go to promote the growth of these teeth was diverted to the brain. Whatever might be the rule in other barbarous nations he knew that in Africans these teeth were never missing, and were generally highly developed.

Professor FLOWER said he considered himself fortunate in having on this occasion selected a subject which had been received by the members present with something more than mere passive interest. Much had been said during the discussion about the wisdom-teeth, but this was really too large a question to enter upon then; he could only again refer them to the paper by Professor Mantegazza. He was sorry he could not give a satisfactory answer to the questions of Mr. Henry and Mr. Hutchinson; it was a fact that in the majority of cases,

when the temporary tooth persisted beyond its usual time, the corresponding permanent tooth would be found buried in the jaw beneath it, but this was not invariably the case ; and whether the temporary tooth had been retained because the permanent tooth had not come forward to push it out, or whether the retention of the temporary was for some reason or other the cause of the permanent tooth not coming up in its place, was more than he should like to decide. He believed that Mr. Tomes was inclined to support the latter view, and he should place great reliance on his judgment. With regard to Mr. Tomes' dog, he had heard that a similar deformity was not uncommon amongst foxes in Warwickshire, and specimens of it had been sent to him. There was no doubt of the fact mentioned by Mr. Tomes that imperfect development of the wisdom-teeth was frequently associated with want of space due to arrest of the growth of the jaw.

On the motion of the President a hearty vote of thanks was given to Professor Flower for his valuable paper ; to Dr. Birdwood for the loan of General Cunningham's work ; and to Mr. F. Canton, Dr. Walker, &c., for their contributions.

The PRESIDENT then nominated Messrs. Thos. Hardy and Gibbings to act as auditors of the accounts for the year, and the meeting terminated.

## ANNUAL GENERAL MEETING.

*Monday, January 12th, 1880.*

EDWIN SAUNDERS, ESQ., PRESIDENT, IN THE CHAIR.

---

THE Minutes of the previous Meeting having been read and confirmed,

The vote by ballot for the election of the Executive Officers for the year was at once proceeded with, and MESSRS. GADDES and FORSYTH were chosen to act as Scrutineers.

The following gentlemen signed the Obligation Book and were formally admitted to Membership by the President:—

Messrs. GEORGE PARKINSON,  
THOS. A. ROBERTS, and  
W. H. WOODRUFFE.

The PRESIDENT announced that the following candidates had been duly nominated and would be balloted for at a subsequent meeting, viz. :—

Messrs. W. A. MAGGS, 12, Albert Street, Regent's Park.

GEO. PEDLEY, High Street, Borough.

FREDK. JOSEPH BENNETT, George St., Hanover Sq.

ARTHUR TAYLOR, Leeds.

CHAS. TAMWORTH, Otford Street, Manchester.

The SECRETARY then read a communication from Mr. W. H. Skeet, of Omara, New Zealand, and handed the model to the President which accompanied the communication. It referred to a case of absorption of the upper jaw due to the pressure of

a pad of cotton-wool. A lady, aged 55, just before leaving England, about three years ago, had an artificial denture fitted, supporting the central canines and bicuspid teeth, the denture clasped to the first molars, her only remaining teeth. As it was rather loose, a pad of cotton-wool was used to tighten it. This answered very well for some time; but about October, 1877, it was found necessary to increase the size of the pad every few days, and at last, in March, 1878, the unsteadiness of the plate compelled her to seek advice from Mr. Skeet. She stated that she had had a plate fitted about twelve years previously, supporting almost the same number of teeth; but before leaving for New Zealand she was advised to have a few remaining stumps extracted and a new piece made. This was accordingly done, with the result mentioned above. In the lower jaw there was nothing unusual; the six central teeth alone remained and some bicuspid stumps. None of the other teeth had been lost by absorption, all had been extracted. In the upper jaw there were, when the patient was first seen, two molars, but one was much decayed and had since broken off; the remaining one was still quite firm, although the fangs were much exposed, the palatine almost to its apex.

Mr. HUTCHINSON also read a communication from Mr. Percy May relating to the retention of the lower temporary molars and canines in a patient aged 19, and exhibited models of the mouth. There was no sign of the permanent canines or bicuspids in the lower jaw. In the upper, the temporary canines were still in place when the patient was first seen; but as there was a slight appearance of the left permanent canine, Mr. May removed the temporary tooth on that side, leaving the other.

Mr. R. H. WOODHOUSE showed the skull of a native of New Caledonia, which had been sent as a contribution to the museum by Mr. Redding, of Sydney, N.S. Wales. The inhabitants of this island belonged to the Papuan race, a branch of the Negro family. Unfortunately some of the teeth had dropped out on the voyage and had been lost, but the upper

wisdom-teeth were remarkable exceptions to the rule to which Professor Flower had called attention at the last meeting. That on the right side was very imperfect, resembling a temporary canine more than anything else ; the left wisdom-tooth was also imperfectly developed and was crowded out of position. He also presented a lower jaw, which had belonged to a Maori (native of New Zealand), which was only remarkable as being a typical specimen of what a lower jaw ought to be.

Mr. CLAUDE ROGERS then related the following case. On the 23rd ult., a man came to him at the hospital complaining that a lower plate which he was wearing had become so fixed that he could not remove it. The patient was an Hungarian, aged 58, a teacher of languages. He had previously applied to a dentist, but without obtaining relief. The plate, of gold, had been made ten years back ; about three years ago he began to find a difficulty in removing it, and for the last fifteen months it had not been out of his mouth.

On examination Mr. Rogers found considerable swelling of the right side of the face, and a fistulous opening under the lower jaw on that side, through which a portion of the gold frame protruded. On looking into the mouth the body of the plate could be seen bridging across from one side to the other, but both ends were deeply embedded in the mucous membrane of the mouth, and held firmly by tough fibrous tissue. The piece was removed with some little difficulty by the aid of the knife, together with a considerable amount of upward traction. It was then discovered that the jawbone had been completely divided, owing to the absorption which had been caused by the pressure of the strong spiral springs, by which the plate had been held in place ; a large V-shaped gap had been made on the right side, into which a portion of the sublingual salivary gland protruded. On the left side the perforation of the bone was not quite complete, but a deep depression had been formed. The patient said he had suffered little or no pain.

The edges of the fistulous opening were well cauterized with nitrate of silver ; it soon began to contract, and on January 9th

was found to be closed. The gap in the bone would probably in time become filled up by cicatricial fibrous tissue. Mr. Rogers added that he had never heard of a precisely similar case, and had therefore thought it worth relating. He handed round the plate for inspection. The patient was still attending the hospital, and could be seen by anyone who might be interested in the case.

Mr. J. S. TURNER asked whether the articulation of the plate was not altered?

Mr. CHARLES TOMES asked in what situation the bone was divided?

Mr. CLAUDE ROGERS answered that the bone was cut through near the mental foramen on the right side. The articulation of the piece was but slightly affected.

The PRESIDENT called attention to an improved dental chair made by Mr. White, of Philadelphia, which had been sent for exhibition.

Mr. HUTCHINSON said he had had an opportunity of examining the chair when he was in Philadelphia last year, and would do his best to point out its advantages over the previous works of the same maker. The chief improvement was in the back, which could be adjusted to any angle, and was so freely moveable in all directions that the chair could be made to hold comfortably either a small child, a well-grown adult, or even a humpback. By lifting the backpiece slightly it would be made to support the patient's back firmly, whilst at the same time a space was left below to receive the voluminous folds of a lady's dress.

Mr. S. J. HUTCHINSON said that some time back the curator had requested members when they had regulation cases under their care to send him a series of casts illustrating the progress of the case at different stages of treatment, together with the plates which had been used. He had accordingly brought a plate and four models, three of the upper and one of the lower jaw, showing the results of treatment in a case which he had

lately brought to a satisfactory termination. Between the taking of the second and third models a period of three months had elapsed, during which the patient was not once seen. The patient was a young lady, fourteen years of age, the teeth were therefore tolerably firm in their sockets. Knowing that he should only be able to see the patient at long intervals of time, Mr. Hutchinson had been very careful to cut away the plate behind the projecting teeth only just sufficiently to enable them to go back into their proper position.

Mr. ASHLEY BARRETT asked whether Mr. Hutchinson thought the improvement would be permanent? His own experience was that although it was not difficult to draw the teeth into line, it was very difficult to keep them so, since the lower teeth tended to push them out again.

The PRESIDENT asked Mr. Hutchinson how long he thought the patient ought to wear the plate in such cases in order to make sure of securing a lasting result?

Dr. FIELD remarked that in most cases where the upper teeth projected it would be found that the lower teeth, having no opponents to bite against, were unduly high in their sockets, and if under these circumstances the upper teeth were drawn back they were soon forced out again by the hard blows of the lower. In such cases he was accustomed to commence the treatment by fitting a plate to the upper jaw so arranged that the lower teeth should bite upon it ; by this means the tendency to elongation was checked, and the upper teeth might then be brought into line with much greater prospect of success.

Mr. HUTCHINSON answered that in his case there was an edge to edge bite, so that he had great hopes that the teeth would remain in their new position. But when the lower teeth bit on the backs of the upper, he agreed with Mr. Barrett that there was a great tendency to relapse, and that much patience and care were necessary to prevent this. As to the time required, he thought that in such cases as that which he had just related, it was sufficient if the patient wore the plate constantly for six

months, and then for another six months during the night only, after this it might be advisable to wear it every second or third night for a short time longer. But if the bite was not edge to edge a longer time would be necessary.

The PRESIDENT then called upon the Treasurer to report on the state of the Society's finances.

Mr. PARKINSON said he was happy to be able to report again, as he had already done for several years past, that the financial position of the Society was very satisfactory.



STATEMENT OF DEATHS, RESIGNATIONS, MEMBERSHIPS LAPSED,  
AND NEW MEMBERS ELECTED DURING THE SESSION 1878-9.

*October 31st, 1879.*

Number of Subscribing Members—Resident .....	112
"      "      "      Non-resident .....	205
	<hr/>
TOTAL .....	317
	<hr/>
Number of Honorary Members .....	30
"      Corresponding " .....	23
	<hr/>
TOTAL .....	53
	<hr/>
Deaths—Resident .....	1
Non-resident.....	1
Corresponding .....	1
	<hr/>
TOTAL .....	3
	<hr/>
Resignations—Resident.....	3
Non-resident .....	5
	<hr/>
TOTAL .....	8
	<hr/>
Members in arrear of payment at Audit, 22nd Dec., 1879—	
Resident .....	11
Non-Resident .....	36
	<hr/>
TOTAL .....	47
	<hr/>
New Members elected during session—	
Resident .....	7
Non-resident .....	17
	<hr/>
TOTAL .....	24
	<hr/>
New Corresponding Members .....	1

The PRESIDENT said the only fault he could find with the Treasurer's statement was that the Society was getting too rich.

Mr. WEST asked whether the sum set down for rent was not a larger sum than had appeared in previous balance-sheets.

The PRESIDENT answered that the Council had long felt that the amount they had paid as rent was a very inadequate return for the very excellent accommodation which they received.

Mr. PARKINSON stated, in reply to Mr. West's query, that when the Council had determined to discontinue the services of a paid secretary, it was felt that this would be a good opportunity for giving the hospital a more liberal return for the shelter it afforded to the Society without at all increasing its expenditure. The rent had accordingly been increased from £50 to £80, and he still thought they were paying a smaller sum than might in strict justice be required of them. As to the evil which the President had called attention to, it was one which could be easily remedied, and the account of the coming year would not show so large a balance. It was in contemplation, amongst other things, to spend a much larger sum in improving the museum.

Mr. WEISS said that he could report the Library to be in excellent order. All the books had been re-arranged and a new catalogue drawn up. About thirty new books had been added during the year, and eighty-six had been borrowed. It was now the most perfect Dental Library in Great Britain, and he would take the opportunity of reminding the members of the great advantages it offered, both for instruction and especially for ready reference to rare and valuable works.

Mr. CHARLES TOMES reported that numerous contributions

had been made to the museum during the past year. It had been made use of to a much greater extent than formerly both by the students and also by the hospital staff, for the purpose of illustrating their lectures. But as this had led to some disarrangement of the specimens, the Council had appointed Messrs. Mayor and Willoughby Weiss to assist him in re-arranging the specimens and in verifying the catalogue. It was also in contemplation to mount and arrange a number of additional specimens which had been kept for some time in reserve.

Mr. GADDES announced on behalf of the Scrutineers that the list of Officers and Council for the year 1880 recommended by the present Council had been elected.

PRESIDENT'S ADDRESS.

---

GENTLEMEN,

THE circling year has again brought round the point of time which reminds us that Presidents have "their exits and their entrances," and in the present case brings him who makes his exit face to face with that solemn word of dire import "nevermore." For however difficult, or even presumptuous it may be in ordinary cases to say what may or may not be in the future, or however deep may be the conviction of duties imperfectly discharged, or of opportunities let slip, it is certain that for him who now retires there is no space for reparation whatever there may be for repentance. Whatever his shortcomings, there they must remain. For the rule of this Society is and ever has been, that the President shall be elected annually, and although at the expiration of his term of office he may feel that he is only now beginning to understand his work, and would be in a better position to discharge its duties in a second than in the first year, yet no precedent can be quoted for such an innovation, much less for one who has a second time enjoyed that

distinction. Whether that rule, which was at first adopted in view of the advancing years and failing powers of the earlier presidents, might not now be reconsidered, and the practice in this respect be assimilated to that which obtains in the Royal Medical and Chirurgical and some other Societies, may form a fit subject for consideration by the Council. It is one of those questions as to which there will always be, as there has always been, considerable divergence of opinion; for while to some the stimulus and enthusiasm due to a novel experience may seem to give a zest to the Society's proceedings, and to be in favour of an annual election, to others these advantages may appear to be more than counterbalanced by a certain immaturity and indecision in the presidential conduct of affairs. On the whole, as an impartial observer who has had some experience of both systems, I venture to express my conviction (though I do so with all diffidence) that the balance of advantage lies with the two years' tenure of office. The number of meetings comprised in a single session is scarcely sufficient for the full comprehension and discussion of questions of importance, or even for the initiation of much needed reforms in the laws or management of the Society; with the result either that they are imperfectly discussed and hastily but not permanently or satisfactorily settled, or are relegated by the retiring

president to his successor, before whom they have to be re-opened and argued afresh. I trust it need not be stated that these remarks are made entirely in the interests of the Society, and are suggested, not by my own, but rather by the experience of others who, for obvious reasons, may have shrunk from making the avowal. Nor, let me add, should I have ventured to touch upon the subject, were it not for being beyond the pale, having already served the office for that second year which, coming in its natural sequence, and not separated by an interval, might appear to be advantageous. One, and a very conspicuous advantage, would certainly be, that the Society would be spared the infliction of two addresses, one inaugural and one valedictory, following so closely upon each other from the same person. When I last had the pleasure of addressing you from this place, I drew a very favourable augury for the future, from the character and attainments of the young members of our profession, who had not neglected the singular educational advantages of the present as compared with former time, and from their attitude towards, and attachment to, the Odontological Society. And I think all will admit that this confident ground of congratulation and expectancy has met with ample justification. If we look back through the year which has just passed, we shall see that it is to them and to their

endeavours that the meetings mainly owe their interest. That it must be so if the Society is to maintain its life and vigour is obvious, but that these demands should have been so well and so promptly responded to, must afford great satisfaction to those who, from old association, feel themselves bound up in its welfare. In estimating the work of the session, two things must be borne in mind: the somewhat narrow limits of the field of work, and also that the Society, being no longer in its first youth, the field has been pretty thoroughly reaped and gleaned. But if we can point to no startling originality or self-evident improvement in science or practice, we have had a series of evenings pleasantly and profitably spent, and by no means barren of sound practical results. The discussions have been free and animated, opinions have been subjected to keen but not unfriendly criticism, which has in no instance transcended that unwritten code of courtesy which every true gentleman obeys instinctively even amid the heat and clash of opposing views. So that we need have been under no apprehension if our proceedings had been subjected to the critical eye of the intelligent foreigner\* who has lately been favouring us with his impressions of our national characteristics, manners, and customs, in

\* Dr. Hillebrand, "Contemporary Review" for October, 1879.

no captious or unfriendly spirit. He would probably have acknowledged that Englishmen, while maintaining the courage of their opinions, are not forgetful of the amenities that belong to an advanced civilization, and even the more caustic critic of the House of Molière\* would be forced to admit that in debate we can hold our own, and agree to differ without those frantic demonstrations of violence which are not quite unknown in the metropolis of taste.

Probably the one characteristic feature of the session just passed, will be found to be the development of that section of our meetings which is included under the term "casual communications." Such communications, from their eminently practical character, having their origin for the most part in the daily work of the consulting room or of that larger sphere of observation afforded by the Dental Hospital, have always been popular, and seem, in their increasing number and importance, to be destined to attract a still larger share of attention. This, it is only fair to say, has been mainly due to the exertions of our excellent Secretary, Mr. Hutchinson, who is not only a notable contributor in this kind himself, but who seems to have a rare magnetic power of calling them forth from others. How many an ingenious contrivance or novel proceeding in

\* M. Sarcey.

treatment or in the method of conducting an operation originating in some emergency, and of considerable interest and value in practice, would be consigned to oblivion but for this part of our meetings. Or again, how often has a new light been thrown on a case of difficulty, or the weak points of an ill-contrived apparatus made manifest by bringing the case before the Society in this ready and informal manner. For with the scant leisure at his disposal and the many inroads made upon that small portion of his time which a man can call his own, who is in the full tide of successful practice, he, not unnaturally, feels indisposed to compose a monograph or prepare an elaborate paper, although he may be conscious of possessing ideas or results of experience not without value in smoothing the path of practice for others. Nay more, he may be gradually made aware that his power of concentrating his attention upon any given subject is impaired from a long course of these constant interruptions; and the inaptitude thus arising, together with exhausted energies, makes him abandon the attempt in sheer despair of accomplishing it with satisfaction and credit to himself. And thus, if there were no such Society as this, and no such provision as it affords for these waifs and strays of thought, much valuable matter would be lost. Not the least among the advantages belonging to these

casual communications, is the wide sympathy which they enlist, and the number of speakers they call up, as compared with the more elaborate and recondite papers. To this I must appeal in extenuation of a laxity in having on more than one occasion permitted the time allotted to this class of communications to be considerably exceeded. Being, however, strongly of opinion that whatever tends to render our meetings interesting should not be discouraged, I have been reluctant to enforce a strict interpretation of the law as to time.

The occasions have been so recent, and are still so fresh in the recollection of those present, that it will be unnecessary (as it might be invidious) to particularise the subjects which have been from time to time brought under the notice of the Society. But there was one at an early period of the session, apart from its own intrinsic interest as a step in advance in what may be called conservative dental surgery, based on antiseptic treatment, which furnished so curious an illustration of a novel and growing feature of modern journalism that I am tempted to bestow on it a passing notice. The subject to which I refer is the replantation of teeth, a matter which has before engaged the attention of the Society, and which promises at no distant period to pass out of the domain of experiment, and to take its

place, within certain limitations as to age, temperament, alveolar integrity, &c., among accepted and recognised surgical proceedings. The revival of this subject at this time was due to the presentation of a memoir to the French Académie des Sciences by M. Magitot, giving a detailed account of a large number of cases treated by himself, and for the most part attended with more or less successful results. It is curious to observe how this "plain, unvarnished tale" became transformed in the hands of "our own correspondent," ever on the watch for things novel and wonderful—how the simple removal of teeth with partially necrosed roots and returning them after excision of the dead parts to the sockets to which they are adapted by nature, suddenly developed into the transplantation of teeth of other persons, or even of the inferior animals; nay, so fervid did his imagination become, that not having the fear of the anti-vivisectionists before his eyes, he proceeded to foreshadow a time when the present artificial arrangements shall become obsolete, and lost teeth shall be supplied by transplanting those of animals, which having taken root and become established in artificially-created sockets, should be excised, and crowns resembling human teeth grafted on to the roots.

Although not believing for one moment that Dr. Magitot was responsible for this flight of

imagination, yet as it had appeared in the leading journal I asked our indefatigable secretary to get access if possible to the original memoir. For this purpose he placed himself in communication with Mr. Charles Tomes, who is never behind-hand in bringing before the Society the latest results of scientific work, and the result of this application was the straightforward and highly-interesting epitome of Dr. Magitot's paper with which we were favoured in March, the motto for which in reference to "our own correspondent" might have been, "Now mark how plain a tale shall put thee down." This, I think, is a very good example of a new phase of journalism, in which a half-truth hastily grasped forms a basis for a superstructure of the most fantastic and improbable character. On other evenings of the past session the attention of the Society has been claimed by Dr. Field on the ever-fresh and important subject of "Gold-fillings;" by Mr. David Hepburn on "Nicotine, and its effects on the teeth," as the result of habitual tobacco-smoking; by Mr. Arthur Underwood on "The functions of the Nerves of Taste," and by Professor Flower in his most interesting "Notes on specimens of Abnormal Dentition in the Museum of the Royal College of Surgeons," which, with the valuable report on Plastic Fillings, presented by the sub-committee appointed in the year 1878, together

with no inconsiderable number of casual communications, constitute the Society's contribution to odontology during the session of 1879.

Death has dealt leniently with the Society during the past year, though he has not left our ranks untouched. For though by an inexorable law, to which all associations of human beings alike must bow, he never fails to exact his tribute, yet we are not now called upon to mourn the loss of those who have occupied a prominent position in our midst, or who were endeared to us by long and close personal intercourse. Dr. McQuillen, of Philadelphia, whose sudden death under very distressful circumstances occurred on March 3rd, was a corresponding member of this Society. He was a zealous promoter of the literature, as well as of the educational institutions of the profession, more especially of the Philadelphia Dental College, and was for many years one of the editors of the "Dental Cosmos." He was unsparing in his devotion to the interests of the profession, even to the extent of detriment to his own personal and domestic affairs, so that his early death is in every sense an unmitigated calamity to his family. I am not aware that he ever carried out a frequently-expressed wish to visit this country, and he was therefore known to most of the members of this Society, excepting to those who had sufficient enterprise to cross the

Atlantic, only by correspondence, which knowledge, however, I may state in my own case only quickened my desire for a closer acquaintance. The unhappy termination of so useful a life seems, as might have been expected, to have called forth the expression of a deep and general feeling of profound sympathy from his professional brethren throughout the Union. We have also to record the death, which took place in July last, of Mr. Patrick, of Southport, one of our non-resident members, and when in addition we have made mention of the decease of Mr. Walter John Woodman, a resident member, and of eight resignations of membership from various causes, we shall have exhausted the list of our losses. To counterbalance these, however, we are able to record a large accession of new members, so that the number on the roll of the Society at the present time is somewhat in excess of that at the corresponding period of last year, and I believe of that of any previous year.

Of events of interest to the profession, though not strictly belonging to the Society, there are not wanting some two or three which may not be passed over. One is the opening of the Edinburgh Dental Hospital and School under flattering auspices, foremost amongst which should be noted the election of a distinguished member of our own speciality to the position of President of the

Royal College of Surgeons of Edinburgh, a circumstance which is not only highly gratifying as a mark of personal appreciation exhibited towards one of our own body, but as a tardy abandonment of the long-existing hostility to special practice which is absolutely without parallel. Another important event is the publication by the General Medical Council of the first authoritative register of Dental Practitioners. This, which, notwithstanding its many imperfections, I regard as the most momentous event in the annals of the profession, giving value to and energizing all that was previously accomplished, I gladly leave in the able hands of my successor, who will doubtless treat it with all the fulness and ability which so important a subject demands. I will only observe that the publication of this Register appears to me to be the great triumph of specialism; and those only can appraise the magnitude of the task by which it was accomplished, who knew the repugnance felt to it on the part of those in authority, and the many and varied obstacles to be overcome. It is now, however, an accomplished fact, and it is not in the nature of Englishmen to let those who have unsparingly devoted their time and energies to the achievement of so great a boon, to which time will render an ever-increasing value, remain without recognition and reward. The formation of the British Dental Association

must also be reckoned among the events which have signalized the year that has just passed. This necessary step to the organization of the profession, the scope and functions of which are as yet but imperfectly understood and defined, has a great future before it, as promoting a freer intercourse and a better *esprit de corps* both amongst town and country practitioners. As, however, this is also a subject which will doubtless be brought before the Society by the new President, I shall content myself with remarking on the difference in the scope and objects of the Association and of this Society, these being in the former political and mundane, as compared with the scientific and æsthetical character of the latter. It is scarcely necessary to say, that there is not and cannot be any antagonism between the two institutions, the ground covered by each being radically and essentially different; the Association taking cognizance of matters which do not fall within the scope of the Society, and being founded, in fact, for the most part, on the lines of the British Medical Association, which has, during many years, rendered signal service to the medical profession. Thus the British Dental Association, representing or embracing the great mass of legitimate practitioners, may fitly address itself to the by-no-means unimportant material interests of the profession, guarding in an especial manner

the purity of the Register, and providing, by means of periodical conventions, by its Journal, and otherwise, for a perfect intercommunication among its members. On the other hand, the Society, ignoring the commercial element altogether, will continue to allure and enrol in its ranks those who regard the profession as something more than the means of making an income, and who seek to advance its status by histological research, by the elucidation of interesting biological problems, or improved processes for the relief of suffering humanity. And men of this stamp, and with such aspirations, though select rather than numerous, will never be wanting, willing and worthy to serve in the temple of knowledge, to trim and tend the golden lamp, or to kindle and keep alive the sacred fire that burns on the altar of experimental science; who are conscious of inward promptings to exclaim with the earnest-minded and philosophic Hamlet:—

“ What is a man  
If his chief good and market of his time  
Be but to feed and sleep? a beast, no more,—  
Sure He that made us with such large discourse,  
Looking before, and after, gave us not  
That capability and God-like reason  
To rust in us unused.”

They know by sweet experience that in using

those divine capacities, and in exercising that God-like reason, is to be found the highest, the purest, and the most enduring happiness. With them it is an article of faith, that work is health—work is life; and recognising the great law of interdependence, extending through “all sorts and conditions of men,” and believing that each one has his allotted task for the good of the commonwealth of humanity, if he will discover it and “do it with his might,” they are proof against *ennui*—that moral paralysis born of an aimless life; and to them the cynical question will never suggest itself, “Is life worth living?” Nor will those who, from temperament, mental constitution, or absence of favouring circumstances, are precluded from attaining to these heights, be without compensation or reward; for the mere social contact with men of cultivated minds, besides stimulating the intellect, makes them more liberal and appreciative in their judgment of each other; and substituting a generous and enlightened altruism for the narrowness and ego-worship which are so apt to crystallize round the character of the specialist, adds the crowning grace of refined and gentle manners.

And now, in bidding you farewell, permit me to express my thanks to the Society for the honour it has conferred upon me in electing me a second time its President; to the Council for punctual

attendance, support, and advice ; to the Treasurer as referee in matters of finance and statistics ; to the Secretaries for zeal and energy in the conduct of the meetings ; and last, but not least, to those my contemporaries who, by their presence and countenance, have gone far to roll back the encroachments of time, and to make me forget the inevitable years.

Mr. THOMAS ROGERS proposed a cordial vote of thanks to the retiring President for the patience and courtesy with which he had presided over the meetings of the Society.

This was seconded by Mr. UNDERWOOD, and carried unanimously.

On the motion of the PRESIDENT, the thanks of the Society were also given to the Treasurer, the Librarian, and to the Honorary Secretaries.

The meeting then terminated.

---

*Chemical Examination of Dental Cements. Fletcher's Porcelain Cements.*

In the report on Fletcher's Porcelain Cement which appeared in the November number of this journal, the above was incorrectly described as pyrophosphate of zinc only, omission being inadvertently made of pyrophosphate of aluminium.

The correct description of the cement according to the analyses should have been a substance composed of pyrophosphate of aluminium with pyrophosphate of zinc.

J. M. THOMSON.











## ORDINARY MONTHLY MEETING.

*February 2nd, 1880.*

ALFRED WOODHOUSE, Esq., PRESIDENT, IN THE CHAIR.

---

THE Minutes of the previous Meeting having been read and confirmed,

The PRESIDENT delivered the following Inaugural Address:—

GENTLEMEN,—Having been placed by you in the honourable position which I now occupy, let me in the first place most heartily thank you for the high honour you have done me in electing me your President,—an office the worthy ambition of every member of our Society, as the highest honour that can be conferred by it, and one also which involves great responsibilities. These it shall be my pleasure, as it is my duty, to the utmost of my strength, to fulfil.

As I am the first President that has assumed office since our speciality has become a close profession, I think that I cannot occupy the present occasion better than by reviewing shortly its past history, tracing the steps by which it has reached its present position, and contrasting the past with the standing it has now attained.

Before the memory of any of us,—indeed, at a period of which there is no certain record,—our speciality in England was always combined with other occupations. It is still so in other countries which are less advanced in civilization. As the knowledge of the organs which are our special care increased, and the skill to treat them became greater, people more frequently sought the aid of those who could relieve their sufferings, and men found it worth their while to devote their entire time to this special industry; and thus there sprang up among us those who were called Dentists.

When I was articulated, in 1842, the profession was well established, and for some years the names of certain practitioners had become household words with those who thought it worth their while to care for their teeth, and who had experienced the benefit these men were able to confer, not only in relieving pain, but in preserving their failing organs. But each practitioner was isolated; few knew their professional brethren except by name or by their work in the mouths of wandering patients. There was no journal, no professional society, no medium of union, no general means of exchanging ideas, and each man was thrown almost entirely on his own resources. The professional literature of forty years ago, compared with that of the present day, was meagre indeed.

The only mode of education was by being articled to a dentist, general surgical knowledge being acquired by reading, and, if possible, by attendance at a general hospital. Those who coveted more extended knowledge, or a more recognized professional status, had to seek them in the curriculum of the Royal College of Surgeons, and the diploma granted by that corporation. But those members of our profession who voluntarily prepared themselves in this manner for their future duties were very few indeed.

In tracing the history of the past twenty years, the most eventful to our speciality, I have been greatly assisted by Mr. Hill's admirable work entitled "Reform in the Dental Profession," and I wish here to thank him for the aid he has thus given me, and to express the hope that he will complete the history, of which he has written so large a portion, by publishing a second edition, in which I trust he will continue the narrative, and so give us a complete history of our profession to the present time by registering the most important events of the last two years.

In 1841, Mr. Waite, anxious if possible to raise the profession from the low state in which it then existed, issued a pamphlet entitled "An Appeal to Parliament, the Medical Profession, and the Public on the present State of Dental Surgery." In this appeal he recommended that young men

seeking entrance into our profession should be required to pass through a course of study extending over not less than three years, in mathematics, chemistry, anatomy, physiology, and surgery; that they should be subject to an examination conducted by examiners appointed by the Royal College of Surgeons (who should be specially empowered so to appoint and examine); and after their proficiency had been so ascertained and approved, that they should serve an apprenticeship to a dentist before being permitted to practise their profession. Although Mr. Waite occupied a good professional position, and although it was seen that if anything was to be done to raise the status of the profession, it must proceed on lines more or less resembling those suggested by him, his appeal met with no response. Like other pioneers, he was before his time.

In 1842, another effort towards the same end was made by Mr. James Robinson, who endeavoured to form a Dental Society, to be followed by a scheme of education; but although he was a man of great energy, nothing came of it.

Next year (1843) Sir Robert Peel's Government brought a Bill into Parliament, by which the charter of the Royal College of Surgeons would have been materially altered. This was considered a fitting opportunity for putting forward the claims of dentists for legislative recognition.

Accordingly several gentlemen met at each other's houses, and, after much consideration of the subject, it was resolved that Mr. Arnold Rogers and Mr. Stokes should wait upon the President of the Royal College of Surgeons and ascertain whether its promoters would consent to clauses being inserted in the Bill providing for the recognition of our profession, and if not to urge that some steps should be taken to that end. They had an interview with the President of the Royal College of Surgeons, and though he did not receive them very warmly, he at length promised to support their application. Several meetings after this were held by about twelve of the leading members of our profession, a further correspondence took place between them and the Royal College of Surgeons ; but in spite of all their efforts they had to abandon the scheme, for the Bill did not pass.

For a few years subsequently to this effort, dental reform slumbered. Nothing of any consequence was noticeable until a letter from Mr. Rymer appeared in the *Lancet* in August, 1855. In it he described the condition of the profession, the sad lack of knowledge in many calling themselves dentists, the injury inflicted by such ignorant practitioners on their too-confiding victims, suggesting that the Royal College of Surgeons should appoint a properly-constituted board of examiners,

who should examine candidates for a licence in dental surgery, and that in conjunction with this there should be a dental college, where special instruction should be given. He instanced the success of similar colleges in America as a reason for a like good result in this country. This letter led to much correspondence in the medical journals, which, to a great extent, aroused the profession. When he considered the time had come for it he inserted an advertisement in the *British Journal of Dental Science*, calling a meeting of the profession at the London Tavern on September 22nd, 1856. On the appointed day the large room was filled with dentists, most of them meeting for the first time. The first resolution advocated the formation of a society of dentists, in which they might exchange ideas and so promote advancement in scientific knowledge and brotherly feeling. The second resolution expressed the desirableness of establishing a system of education, to be followed by an examination, and that thus both the profession and the public might be benefited. The third appointed a committee to carry the resolutions of the meeting into effect.

The result of this meeting was the formation of the College of Dentists, which had an independent existence till 1862. The history of this movement I hope to revert to shortly, but must now con-

sider another effort, in the result of which we are more directly interested.

Shortly after the writing of Mr. Rymer's letter in December, 1855, eighteen gentlemen met to consider how best the interests of the profession might be advanced, and they came to the conclusion that the plan which promised most was to affiliate it to the Royal College of Surgeons. They, therefore, drew up a memorial addressed to the President of the Royal College of Surgeons, in which were described the unsatisfactory position of dental practitioners and the desirability of an educational course being established under the supervision of the Royal College of Surgeons, to be followed by a special examination in dental surgery, as there was already in midwifery. No reply was received to this for more than a year, and these gentlemen felt the necessity for more extended and united action in the profession, and therefore decided to form a society which would bring the members of the profession together and enable them to take united, and hence more powerful, action in the direction in which they had hitherto unsuccessfully moved.

In November, 1856, they accordingly founded the Odontological Society, under the presidentship of the late Mr. Samuel Cartwright. The first meeting was held at the house of Mr. Saunders, but they afterwards took place at the rooms of the

Medical Society in George Street, Hanover Square, and here they found a home for about two years.

The Council of the Odontological Society in February, 1857, wrote to the President of the Royal College of Surgeons, reminding him that no answer had been received to the memorial sent to him more than a year before, and requesting the consideration of it, and the adoption of such measures as should be deemed most expedient to advance the condition of dental surgery in this country. The secretary of the Royal College of Surgeons replied to this in about a month, stating that the Royal College of Surgeons was not in a position to grant special examinations, and advising that the Odontological Society should appeal direct to Parliament for the desired affiliation to that body. The Odontological Society, therefore, appointed a special committee to communicate its views to the Royal College of Surgeons, and a rather vigorous correspondence ensued between the two bodies, in which the views of each were fully stated, the result being that the solicitor of the Royal College of Surgeons drew up the following clause, which it was proposed to get inserted in a Bill introduced by Mr. Headlam for the regulation of the medical profession, which was then before Parliament: "It shall, notwithstanding anything herein contained, be lawful for Her Majesty, by charter, to grant to the Royal College

of Surgeons of England power to institute and hold examinations for the purpose of testing the fitness of persons to practise as dentists, who may be desirous of being so examined, and to grant certificates of such fitness." On July 6th, 1858, in a Committee of the whole House of Commons, the above clause was introduced and adopted without one dissentient voice.

The first great step—that of legislative recognition, and consequently professional standing,—for which so many of our professional brethren had long struggled and worked, had now been reached, all difficulties so far had been overcome, and the Royal College of Surgeons had accepted its new responsibilities. A curriculum was next agreed upon. The Dental Hospital and School were established at first in Soho Square, by-and-by to be removed, in consequence of increased usefulness, to its present central and commanding position in Leicester Square. Thus the foundation-stone of our present position was laid, after much patience, perseverance, and labour. I may here remark that the first diplomas of dental surgery of the Royal College of Surgeons granted under the new condition of things were given on the 13th of March, 1860.

But to revert to the College of Dentists. In 1856 that institution was established, the first president being the late Mr. James Robinson, who

was, as we have seen, one of the pioneers in clearing a way for the present position of our profession. The principles on which the College of Dentists was founded were those of independence from the Royal College of Surgeons. It proposed to educate young men in its own school, grant its own diplomas, and altogether exist without the pale of the Royal College of Surgeons. It was also a scientific society, having its monthly meetings, at which papers were read by its members and other scientific men outside its body. It had its museum and library, and its quarterly journal of dental science. By the end of 1856 it had about 150 members.

As early as 1857 those who wished well to both societies tried to bring about an amalgamation, but after the terms on which they were to be united had been agreed to by delegates of the two societies, a meeting was held of the College of Dentists, when the subject was fully discussed and the question at last put to the vote, when the project was negatived by a small majority, and thus the College of Dentists continued to have a separate existence for some years.

As in most societies the College of Dentists had its difficulties and its successes, but the courage and perseverance of its promoters carried it through all its trouble. Although it had during three years unsuccessfully petitioned Parliament

for a charter, it had successfully established its Metropolitan School of Dental Science with its adjunct the National Dental Hospital, and had accomplished a considerable measure of success.

Thus the College of Dentists had progressed until the year 1862, no doubt stimulating our society by the emulation it caused, and thus hastening the success which crowned our efforts. The Royal College of Surgeons being now empowered to grant diplomas in dental surgery it was evidently hopeless to expect the Government to grant a charter to the College of Dentists, and it was deemed desirable by its leaders to abandon that idea and seek amalgamation with the Odontological Society.

A meeting of four delegates from each society was accordingly held on December 22nd, 1862, at the house of the late Mr. Arnold Rogers, and certain modifications of the bye-laws were made so as to admit the members of the College of Dentists. The name of the Society was changed from the "Odontological Society of London" to the "Odontological Society of Great Britain," and other matters arranged which were necessary for the reorganisation of our society. On May 4th, 1863, the union of the two societies was practically consummated by 111 ordinary and 3 honorary members of the College of Dentists joining themselves to the Odontological Society of Great Britain.

Since that time our Society has gone on steadily progressing, gaining in strength and character, the papers read have been more scientific and not less practical, and our voice has been more respected in the medical world.

Thus, so far as our Society—as one of the professional societies of the kingdom—was concerned, we had reached a position where, in the opinion of many, we might “rest and be thankful.” But although a considerable measure of success had been gained, yet, both for the profession at large and especially for the public, much remained to be attempted and, if possible, achieved. True it was possible for a young dentist to procure a thoroughly professional education, but it was still open to all and sundry, the charlatan and the illiterate, as well as the accomplished and trained professional gentleman, to enter the profession. Another great step had to be attempted, and if that were gained we might well deem that there had been placed the coping-stone on the edifice of dental reform. It was necessary that our calling should be raised by legislative enactment into one of the professions, and especially that for the future all members entering the profession should, like those of the allied professions of medicine and surgery, enter only by the door of a thorough professional education, tested by a thorough and complete examination, and then guarded by a thorough and compulsory legislation.

This most desirable condition of things has been brought about in the following way. On the 31st of August, 1875, a meeting was held in Manchester by some of those gentlemen who felt strongly in the matter, and the result was that a committee was formed entitled "The Dental Reform Committee," which set itself the task of getting an Act passed which should compel all dentists already in practice to be registered, and after a certain period that all who registered should hold a diploma as licentiates in dental surgery.

The first committee held in London met at 11, Charles Street, on March 17th, 1878, when the Treasurer, Mr. James Parkinson, was voted to the chair, and on his declining to take the Presidentship, Mr. Samuel Cartwright was elected to that office. This was followed by many other meetings. Owing to differences of opinion on certain matters, changes in the composition of the council took place, and Mr. Tomes was elected chairman, and Mr. Turner honorary secretary, in June, 1877.

"In the multitude of councillors there is wisdom," so the Dental Reform Committee was the means of framing the plan and bringing the subject of reform to an advanced point; but at last the business needed the work of a smaller body, which could move more quietly than an association of many members.

As you all know, it was resolved to appeal direct to Parliament, and Sir John Lubbock, Sir Philip Egerton, and Mr. Gregory most kindly undertook to bring in our Bill, and to fight it through all the delays, obstructions, opposition, and fatalities that beset the passing of a measure, however beneficial, in the hands of a private member. Fortunately, as you also know, the Duke of Richmond's Bill was introduced by the Government at the same time, which among other objects proposed to deal with our profession. Yet it was a most delicate and difficult task to advance our Bill and not clash with that of the Government, and naturally there was considerable cause for alarm as to its ultimate success.

The general scope and tenour of the Bill having been decided by the Association, Messrs. Tomes and Turner were entrusted with the onerous and difficult duty of seeing it through Parliament. The Association was only to be called together when absolutely necessary. The Bill was drafted with great care, its clauses carefully considered and carefully re-arranged from time to time, to make them assimilate as much as possible with the Government Bill. This was the work of Mr. Tomes and the hon. secretary.

At last, the Bill having passed the Commons, had to be taken to the House of Lords, and there, fortunately, Lord Lansdowne undertook

to "father" the Bill, after having carefully gone over its clauses with the draughtsman, Mr. Fitzgerald, and his lordship introduced the amendments, referred to by Lord Sandon as a condition of his support when the Bill was in the Commons, drawn up at the suggestion of the Government. The Bill thus amended was supported by the Duke of Richmond and Gordon, and in him practically by the Government.

In Messrs. Tomes and Turner not only the Association, but the whole profession, had all that could be desired. Mr. Tomes, to whom our profession has in other respects been so deeply indebted, had all the gifts necessary for pushing the business forward, in addition to well-earned leisure. And Mr. Turner was also equally able and devoted, sacrificing time, health, and everything that stood in the way, and rendered to Mr. Tomes invaluable assistance in the progress of the Bill.

These gentlemen were incessant in their labours, now closeted with their legal advisers, now consulting with the members who undertook the Bill in the House, either prompting the proposer of the Bill, or interesting other members in it. And so, in ways it would take too long to enumerate here, it came to pass, as you all know, that through their instrumentality our Bill became an Act of Parliament, while the Government Bill became for the session a dropped measure.

“The Dentists Act,” of July 22nd, 1878, has thus procured for us the privileges we enjoy. No longer isolated and without cohesion or recognition, we stand, for the first time, as a profession affiliated to the Royal College of Surgeons and its noble profession. No one can practise our speciality if he is not registered. If a dentist is convicted of crime or disgraceful professional conduct, he is liable to have his name struck off the register. We are freed from serving on juries. From this time no one can enter our profession who has not passed through a curriculum which ensures that he is at least well-educated and specially taught the practice of his profession. In short, we are now as exclusive a body as those of the Surgeons or Physicians.

From a notice of after-dinner speeches at a dentists' dinner, which recently appeared in the *British Medical Journal*, it seems that an effort is likely to be made to deprive the licentiates in dental surgery of some of their privileges; but I feel assured the determination and energy which enabled us to obtain our privileges will be exercised successfully in retaining what has cost us so much.

Opposition failed in preventing the passing of the Dentists Act, and attacks upon it must again fail if we exercise the same activity and determination which carried it through.

Compare our present status with our condition thirty years ago, when we were almost ashamed of our name, and I am sure we must congratulate ourselves, and feel deeply grateful to those through whose exertions we are what we are.

But occupying this position, it behoves us to be worthy of it. Men formerly calling themselves dentists did what each thought was right in his own eyes.

Now, we are members of a corporate body, and we should each see that our professional conduct is such as is unimpeachable as professional men, each striving to act in the most honourable way, both towards his patients and his brethren.

Such is the state of our speciality by law, but laws without some one to enforce them are dead letters, and this to a great extent would no doubt be the case with the "Dentists Act" if there was no organised body to see to the enforcement of its penal provisions.

At a general meeting of the profession held at Willis's Rooms on the 3rd of March, 1879, it was resolved that an Association should be formed to see that the Act be properly carried out; that those who registered did so according to the meaning of the Act, and were *bonâ fide* members of our profession.

The members of the Dental Reform Association were requested to form the nucleus of the

new "British Dental Association," other members being elected so as to make the Association thoroughly representative of the profession.

It will be the business of the Association to investigate the grounds on which alleged incorrect registration has been effected, and to obtain such evidence as may enable the dental committee of the General Medical Council to remove the names of those who have no right to be on the register. The work of this Association has yet to be done.

Springing out of the British Dental Association is a Benevolent Society, which will provide aid for those of our profession or their families who have become impoverished and need a helping hand. This Society is still in its infancy, but from its healthy birth promises to have yet a hearty manhood, full of good works.

I have occupied much of your time with general professional matters, but I felt that the members of the Odontological Society were of all dentists most interested in the progress of the whole body, and therefore I do not apologise.

But now as regards ourselves personally, let me express the hope that the session now begun may be a fruitful one. True, the routine treatment of our practice has been often well represented in papers read before this Society, but we cannot yet say that it is perfect; improvements are yet to be made even in routine work. The

last thirty years have witnessed quite a revolution in our general practice. Let us hope that this year may see still further advancement in it.

But there are other collateral topics to be discussed: let us hope that some of our members may bring them before us. The microscope has much yet to reveal. Comparative anatomy may teach us much. And on many subjects we must all feel we have much to learn. Only the other day we saw that a plan of enabling the deaf to hear had been discovered in America. It consists of a peculiar kind of telephone, which is applied to the teeth, and through them conveys the vibrations of sound to the organ of hearing. Let us hope that a full account of this and other scientific novelties connected with our work may occupy some of the evenings of the session.

Gentlemen, I thank you for your attention to what I fear has been rather a dry address, but I felt that at this particular epoch I could not do otherwise than trace our rise and progress from chaos to our well-organised state, leaving to you, gentlemen, to see that the goodly tree which has passed through so many storms, and has needed so much careful culture, bears really good fruit.

The PRESIDENT announced that the following nominations had been approved by the Council, and would be submitted to the general ballot at a subsequent meeting :—

GEORGE JOSEPH HONGO, 15, Allez Street, St. Peter Port, Guernsey.

MAURICE HONGO, 36, Belmont Road, St. Heliers, Jersey.

HUGH WILLIAM HUGHES, 10, Cavendish Place, Cavendish Square, London.

LAWRENCE READ, 18, Hanover Street, Hanover Square, London.

Messrs. CHARLES NOBLE, L.D.S., Eng., 1, Drayton Terrace, South Kensington, and FRANCIS EWBANK, M.R.C.S., L.S.A., 24, Queen Anne Street, signed the Obligation Book and were formally admitted to Membership by the President :—

The following candidates were then balloted for, and duly elected Members of the Society :—

W. ST. GEORGE ELLIOTT, D.D.S., 39, Upper Brook Street, Grosvenor Square ;

A. BAXTER VISICK, L.D.S. Ireland, D.D.S. Philadelphia, 41, Brook Street ;

W. F. THOMPSON, M.D. New York and San Francisco, D.D.S. New York, 41, Brook Street ; and,

MORTON A. SMALE, M.R.C.S., 165, Edgeware Road ; Resident Members ; and

HERBERT COATE, D.D.S., Cheltenham ; and

MARTIN HENRY, L.D.S., Eng., 25, Cheriton Place, Folkestone ; Non-Resident Members.

Mr. R. H. WOODHOUSE showed a sequestrum which had been removed at the Dental Hospital in December last from the lower jaw of a woman aged thirty.

It extended from the left second molar posteriorly into the ramus of the jaw, involving the sockets of the second molar and of the wisdom tooth. No cause could be assigned for the disease, but the patient had suffered for nearly two years from intense pain, swelling, and fixity of the jaw. As she was unable to open her mouth except to a very small extent, nitrous oxide gas and ether were administered, and the jaws forcibly separated. Mr. Coleman then extracted the second molar with a pair of hawk's bill forceps, and the sequestrum, which had been previously ascertained to be distinctly moveable, was removed without much difficulty by means of the same instrument.

A complete section of the inferior dental canal, an inch in length, was contained in the bone removed. When the patient was last seen, fourteen days previously, the jaw had quite healed, except a small sinus near to the angle of the jaw. An attempt had been made, a few months previously, to remove the diseased bone by operation externally. The nerves in the teeth anterior to the first bicuspid were healthy. No caries in any of the teeth. The patient could move the jaw freely, and masticate with comfort. Loss of sensation over a space the size of a shilling where the terminal branches of the inferior dental nerve are distributed to the skin of the chin.

Mr. W. E. HARDING, of Shrewsbury, then related the following case :—

A gentleman brought to him his son, eleven years of age ; the boy's right central incisor projected above the level of the other teeth and was loose in its socket. Mr. Harding at once inquired if he had had a fall on the ice, but the boy declared positively that he had had neither fall nor blow. The tooth presented that peculiar dark opaque appearance indicating death of the pulp, and on more careful examination, Mr. Harding observed a small dark spot on its lingual surface close to the neck, this proved to be the opening of a minute canal communicating directly with the pulp cavity. On again questioning the boy, he said there had formerly been a small "knob" on the tooth in this situation, but one day he bit it off. A good deal

of pain followed, and the tooth soon became tender and loose. It was evident then that a small node or cusp had grown on the tooth, and that into this node a horn of pulp had projected. When the latter excrescence was chipped off this prolongation of the pulp was exposed, inflammation of the whole pulp resulted, and then death of the tooth.

The PRESIDENT said it was indeed a very unusual case, and he had never met with one like it. These little outgrowths were, of course, common enough, but the communication with the pulp cavity was certainly not common. Cases were occasionally met with in which death of the pulp occurred, although a very small amount of decay had taken place ; he thought that possibly this might be due to an outlying horn of pulp approaching unusually close to the surface of the tooth. He thought also that a lesson might be learnt from this case, viz., that one should not be too ready to snip off these little projections, at all events in young subjects, lest death of the tooth should ensue.

Mr. STORER BENNETT said that since the term node had a distinct specification in surgery, he thought it was scarcely appropriate to apply it to this growth. It was really an odontome seen at an early stage of its existence. We were in the habit of thinking of odontomes as solid tumours, and no doubt as usually met with they were so. Their method of development did not differ essentially from that of the normal parts of the tooth. In this case it consisted in the production of an unusual process of the normal formative dental pulp, on which a cap of enamel and dentine in due time appeared, and which would eventually have resulted in the complete solidification of the growth but for the accident which cut short its existence, and which happened at just that stage in its history when its structure consisted of a mass of enamel and dentine forming a tube in which was enclosed a process of pulp connected with that of the main body of the tooth. The little mass being broken off, of course exposed this tube, and so the whole pulp,

thus giving rise to the irritation for the relief of which the patient sought assistance.

Mr. F. WEISS said that Mr. Harding's case reminded him of one which occurred in his own practice some years ago. It had been recorded at the time, but he would briefly mention the chief facts. A gentleman came to him complaining of great pain in one of his incisors. The tooth was not in the least diseased, nor had there been any projection as in Mr. Harding's case ; but on close examination a small opening could be seen on the surface of the tooth through which a fine horsehair could be passed into the pulp cavity. The opening must have been closed until shortly before the patient came to Mr. Weiss, when symptoms of acute inflammation of the pulp set in : possibly the aperture had been covered with a thin layer of enamel, and this had been lost by wear. Mr. Weiss recommended that the opening should be enlarged and the pulp devitalized, but the patient, being impatient, went to another practitioner who removed the tooth, and Mr. Weiss had afterwards an opportunity of examining it carefully.

Mr. DAVID HEPBURN said that in the absence of any more important communication, he would mention a case which had come before him a few days previously. A young gentleman, sixteen years of age, fractured his left upper central incisor by a fall on the ice. The remarkable point about the case was that though the fracture was complete and not in the least impacted, and although the patient did not come to Mr. Hepburn till the day after the accident, the fragments were still so accurately adjusted that he had to ask the patient to point out which was the broken tooth. The distal fragment was held in position partly by the nerve pulp and partly by some fine shreds of periosteum. Mr. Hepburn removed the loose fragment and the pulp, and then pivotted the stump in the usual way.

Mr. BROWN MASON, of Exeter, said a similar accident had befallen a patient of his, but it occurred in a much more extraordinary way. This gentleman had been playing billiards with a friend, and having finished their game they were amusing

themselves with a little practice. Mr. Brown Mason's patient was in the act of aiming at the red ball when his opponent attempted a hazard off it, but, missing its aim, his ball struck the cushion, rebounded on to the point of his friend's cue, ran up it, and broke off two-thirds of the crown of his right central incisor. The pulp was exposed, and the same treatment was carried out as in Mr. Hepburn's case.

Mr. J. S. TURNER showed a lower canine of a most extraordinary shape, it resembled a partially straightened S ; he had examined and cut up several thousand teeth but had never before met with one so deformed. The tooth was dead, and he had assured the patient that its removal would be a very simple matter, but neither of them had found it so in fact.

The PRESIDENT then called upon Mr. OAKLEY COLES to read his paper on the "Classification of Deformities of the Upper Jaw."

*Deformities of the Upper Jaw: An Attempted  
Classification of them.* By OAKLEY COLES.

BEYOND those well-marked deformities of the upper jaw known as congenital cleft palate, and fissured alveolus, we have others of a more or less severe form that are of sufficient importance to attract notice on account of the defective articulation they may be associated with, or that may excite interest from the endeavours that have been made from time to time to translate their pathological signification.

The question has been invested with an unnecessary amount of obscurity from the variety of terms that have been in use to express very often the same class of deformity, thus at the present time there would be no difficulty in finding in the works dealing with this and allied subjects such names as—(a) V-shaped maxillæ, (b) contracted arch, (c) saddle-shaped palate, (d) high roof, (e) vaulted palate, (f) narrow or contracted palate, (g) highly-arched palate, (h) keel-shaped palate, (i) Gothic palate, (j) upsilon palate.

These terms are used in many cases without any accompanying explanation of the meaning

attached to them by the author, and since in most instances they have no definite signification in themselves, confusion and misconception have very often arisen in the minds of those who have had to study and investigate the class of cases under discussion.

2. If the importance of the subject be such as to have induced so many authors to have adopted so varying a nomenclature, it seems self-evident that a more precise and scientific classification is necessary.

3. It would be but little to the purpose were anyone to propose a simply arbitrary set of terms to supersede those that are now in use. They would be open to the objections urged against existing names, and would, if merely arbitrary, still lack that degree of scientific accuracy that is essential to the successful prosecution of a purely morphological investigation.

The chief obstacle to the attainment of the necessary end may be said to have been due to the absence of any exact standard of an absolutely perfect form of jaw.

To say that a well-developed dental arch will correspond in outline with one or other of the conic sections is only to remove the difficulty one step further off and render a complex subject still more difficult of description.

4. My investigations as to the correlation

between the palate and cranium, commencing some ten years ago, compelled me to take some record of the dental arch in such a manner that it could be easily recorded and tabulated. The ordinary terms, such as paraboloid, elliptical, horse-shoe shaped, and others were quite useless for my purpose, on account of the almost infinite variety of form that each term might be made to include.

After a series of measurements and experiments that I need not now describe, I arrived at the conclusion that the triangle was the best geometrical figure for the object that I had in view, as it gave in the simplest and most diagramatic form two at least of the measurements that were required, namely, the length and breadth of the dental arch. The interbicuspid measurement I had not at that time thought of, except as an independent item, to be measured apart from the length and breadth.

5. Desiring to form a triangle that should be applicable to the largest number of cases, whether edentulous or not, and capable of use with approximate accuracy to all races alike, I decided to form the base of the triangle by an imaginary line drawn from the centre of the distal surface of the second molar on each side, as near to the level of the alveolus as the third molar (if present) would admit of. By choosing the second in preference to the third molar, I disposed of the liability to

error arising from abnormalities of the wisdom tooth, and at the same time was enabled to take my measurement at any period after the thirteenth year of the patient's existence.

One other object was gained by the choice of this position, and that was that the absence of the molars on one side of the mouth did not of necessity render measurement impossible, as the centre of the distal surface corresponds very nearly with the centre of the alveolar ridge, which in this region is generally well marked.

The base being thus obtained, the remainder of the triangle was produced by lines drawn from the point of contact of the mesial surfaces of the two central incisor teeth to the extremities of the base line already referred to. This incisive point, as I shall hereafter call it, still keeps the angles of the triangle upon the central line of the alveolar ridge, so that in this respect again we measure from a point of least variation.

We have thus procured a triangle, giving at the molars the breadth of the jaw, and by a line drawn from the apex of the triangle to the centre of the base line the length of the jaw, exclusive, of course, of the space occupied by the third molars. My own observations in connection with cleft palate, and the observations of Dr. Smith, of Edinburgh, and Dr. Langdon Down and Mr. Charles Tomes, had, however, caused me to pay

special attention to the measurement of the space between the bicuspid from either side of the mouth.

This interbicuspid measurement has always been deemed a very important one, and most writers on the deformities of the palate have referred to it.

Contrary to the practice of some observers, I was induced to choose the second bicuspid as the best point of observation, as it corresponds with the position occupied by the second molar of the primary dentition, and is altogether the tooth subject to the least variation of position, if the changes incident to the growth of the jaw be normal in character. Whilst on the other hand, given an abnormally-developed jaw, we may be tolerably certain that the second bicuspids will to some extent be affected. The interbicuspid measurement was, therefore, taken at the line of junction of the neck of the tooth with the margin of the alveolus on either side of the jaw, this position being chosen so as to avoid the inaccuracies likely to occur in the event of a largely-developed bicuspid crown.

At a distance from the base, corresponding with the distance of the second bicuspids from the distal surface of the second molar, this interbicuspid line was allowed to traverse the triangle. These lines and distances were obtained with an ordinary

pair of compasses, and measured off by means of a millimeter rule. Beyond this, the height of the palate was taken, together with the total length (in the skull), and also its transverse and antero-posterior curves.

6. In the method that I have thus endeavoured to describe there are certain sources of inaccuracy and errors of observation that may be readily seen, and to some extent allowed for.

Thus, deformity of the palate, arising from premature ossification of the intermaxillary or palatomaxillary sutures, would of necessity invalidate the tracings and measurements of the palate, whilst abnormally large crowns to the teeth, or extreme irregularity in the crowns, would quite as obviously render comparatively valueless the data on which the triangle was constructed. Still, if these sources of error be fully recognized and carefully allowed for, an approximately accurate diagram may be obtained.

7. My observations were in the first instance directed solely with the object of ascertaining certain normal measurements, and the first set of these dimensions were taken by means of strips of lead, accurately moulded to the contour of the palate in different positions, the results being immediately outlined on cardboard; the measurements were then taken off by means of compasses and a millimeter rule. It will be desirable here to give three dimensions of the palate, viz., the

width, taken from the inner margin of the alveolar process opposite to the second bicuspid; the height, taken from the centre of the line representing the above width to the centre of the palatal arch; and the length, taken horizontally from between the central incisor sockets to a vertical line let fall from the posterior nasal spine. The skulls examined fall into two series: first, thirty-four adult skulls of European origin; and secondly, thirty-two adult skulls of mixed races.\* In the first series the average length was 49 millimeters (maximum 58 m., minimum 40 m.); the average width was 35 m. (maximum 42 m., minimum 31 m.); the average height was 9 m. (maximum 15 m., minimum 5.5 m.). In the second series the average length was 54 m. (maximum 65 m., minimum 43 m.); the average width 35 m. (maximum 40 m., minimum 29 m.); the average height was 12 m. (maximum 18 m., minimum 6 m.). These figures will be found to correspond pretty closely with those published by Dr. Claye Shaw,† except in relation to the height of the palate, in which Dr. Shaw's results differ very materially from those which I have obtained. The following table will show at a glance the points of agreement and difference between the two series of investigations:—

\* On the different size of the jaws in civilized and uncivilized races, see Darwin, "Descent of Man," vol. 1, p. 118; Herbert Spencer, "Principles of Biology," vol. 1, p. 445.

† *Journal of Mental Science*, July, 1876, p. 200.

## MEASUREMENTS OF THE NORMAL PALATE.

	Average length in millimeters.	Average width in millimeters.	Average height in millimeters.
European skulls (34) (Oakley Coles.)	49 { max. 58 min. 40	... *35 { max. 42 min. 31	... *9 { max. 15 min. 55
Skulls of mixed races (32) (Oakley Coles.)	54.9 { max. 65 min. 43	... *35 { max. 40 min. 29	... *12 { max. 18 min. 6
Number and ori- gin not stated (Claye Shaw).	50 { max. 57 min. 40	... 36 { max. 44 min. 21	... 14.5 { max. 25 min. 9
	At first molars. At first bicuspids.		At first molars. At first bicuspids.

\* Taken at second bicuspids.

The only way in which I can account for the discrepancy between Dr. Claye Shaw's measurement and my own in regard to the height of the palate is, by the supposition that he has taken his level from the grinding surface of the teeth, whilst my own was from the margin of the alveolus.

Beyond the dimensions just enumerated, I obtained with the compasses the dental triangle to which I have already directed attention. The first set of observations having special reference to the palate, and the second to the alveolar and dental arches.

Two main facts are deducible from the data obtained in the second instance; first: that the best type of well-developed English jaw will give an equilateral triangle as the result of measurements taken in the way I have described. Secondly: that the interbicuspid line will fall upon the triangle some five-tenths in the perpendicular from the base line, and that the extremities of the interbicuspid line will pass well beyond the boundary of the triangle on either side.

Further observations are of course desirable in order to render these statements absolute facts. I have taken an English jaw as the standard type, as it will be found that with other nationalities there is, I think, the possibility of obtaining certain race distinctions from the character of the triangle. Records for such a purpose must, how-

ever, be extended over a very much larger number of skulls than I have at present been able to examine. The facts, however, that I have already obtained are sufficient for the special purpose to which this paper is devoted, whilst we look for the help to be obtained from many workers in many places before we can assert any definite conclusions beyond those already given.

8. Having obtained what appeared to be a reliable standard figure, my first impulse naturally was to apply the same method of measurement to the cases of deformities of the upper jaw that were so frequently being brought under my notice.

9. The results were so marked and special in their characteristics that there seemed little question that the difficulty of classifying the various forms submitted to the test of the triangle was in a fair way of being removed. Continued investigations confirmed my first impressions, and those investigations I have endeavoured to reduce to a practical issue by making them the basis of a nomenclature that I now venture to submit to the opinion of the profession.

Taking typical cases of strongly - marked deformity, I noticed that the nature of the triangle and the position of the interbicuspid line in its relation to the triangle had a definite and intelligible meaning, and further that I could

transfer to a diagram records of a case that should be capable of a precise interpretation.

Not taking into account an almost endless variety of deformities that possessed some slight modifications as compared with the more pronounced types, it yet seemed quite possible to classify a sufficient number according to rules that were capable of a fairly general application.

10. Thus to one or other of the divisions, long, short, large, small, prominent pre-maxillary region, deficient pre-maxillary region, and true V-shaped arch, I found it possible to assign each case.

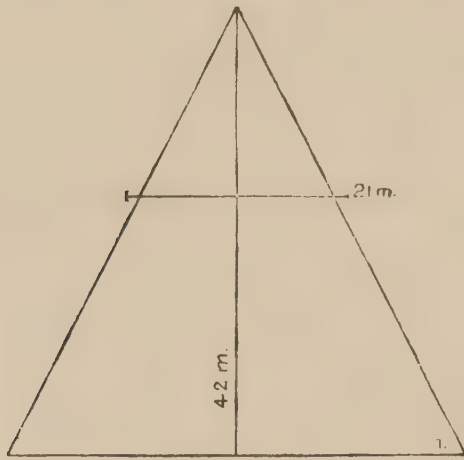
These were scarcely satisfactory terms to use, however, and I have therefore adopted a set of words already known in cranial morphology, modifying their terminations only, in order to avoid a certain hybrid phrase that might otherwise have been created.

Following the order of classes already given, we have then the dolichoid, the brachoid, the macroid, the microid, the premaxillary prognathous, the premaxillary upognathous jaw, and the true V-shaped arch of congenital idiocy, to which I have assigned the name lambdoid.

In order to render the subject complete, I propose now to give first the name (with its derivation) and definition of each class, and then pass on to a concise description of a typical case.

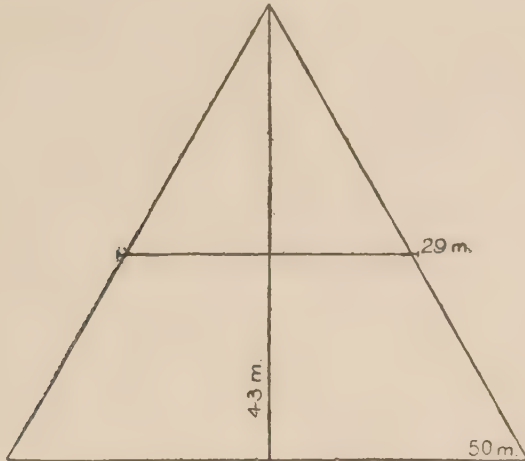
1. DOLICHOID JAW ( $\Delta\omicron\lambda\iota\chi\omicron\varsigma$ , *long*).

*Definition.*—A term applied to an upper jaw in which, with an average or less than average length from base to apex of triangle, the interbicuspid line will be found resting at its extremities



upon the sides of the triangle, thereby showing the degree of parallelism (tending even to bicuspid contraction) of the two sides of the dental arch. The preceding definition of the dolichoid arch will at once show that long and short are but relative terms in relation to this classification ; and that although we may get other varieties possessed of absolute qualities, yet the dolichoid jaw is only long in relation to its width, and not absolutely long in comparison with other jaws. In discussing the qualities of the triangle of the brachoid jaw, I shall have to refer to this again, in order that the points of differentiation may be perfectly

clear. Looked at from above, the dolichoid jaw presents the outline of an early English or Saxon window, with its circular top and parallel sides.

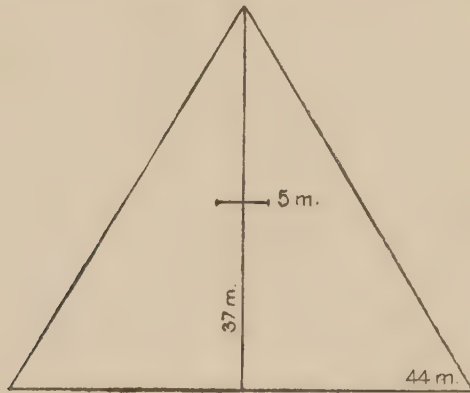


Its special features are as follows : the small size of the dental arch occupied by the incisors and canines ; the straight line (more or less marked) on which the bicuspid and molars are implanted in the jaw, the higher plane of the vertex of the palate, and the well-nigh vertical direction indicated by the two lateral walls of the palate, in continuation of the alveolus of the bicuspid and molars.

## 2. BRACHOID JAW (*Βραχὺς*, *short*).

*Definition.*—A term applied to an upper jaw in which, with a less than average length from base to apex of triangle, the interbicuspid line falls upon or within the sides of the triangle, or quite outside of the sides of the triangle. The above

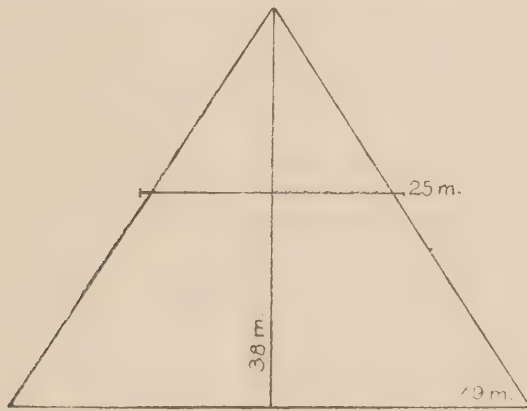
definition shows that there are two varieties of short or brachoid jaws. In the one instance there may be a bending in of the arch in the bicuspid region to such an extent that, looked at from above, it presents the outline of two italic “*f*’s” reversed, and almost meeting towards their centre; whilst in the other the bicuspid may be but little within the normal range, or even beyond it. In such a case the brachoid character of the jaw is



due to the extreme frontal flattening in the region of the incisors and canines, and in some measure to bulging out of the bicuspid. The palatine surface will present a flattened arch, and occasionally the palatine process of the one upper maxilla will be on somewhat higher plane than the other. This may be seen by making a transverse section of the plaster model of the mouth; or it may be observed, though less distinctly, by means of the tracing obtained from the leaden rule. Under the classification “brachoid” would be included most of those cases that we now find

described as contracted maxillæ. It may at first appear as if there were very little difference between the dolichoid and the brachoid jaw; but closer observation will show that there is a very marked distinction.

Thus, whatever the length of the dolichoid jaw, the interbicuspid line will not fall within the triangle, whilst with the brachoid jaw it may fall anywhere within the triangle—unless, indeed,

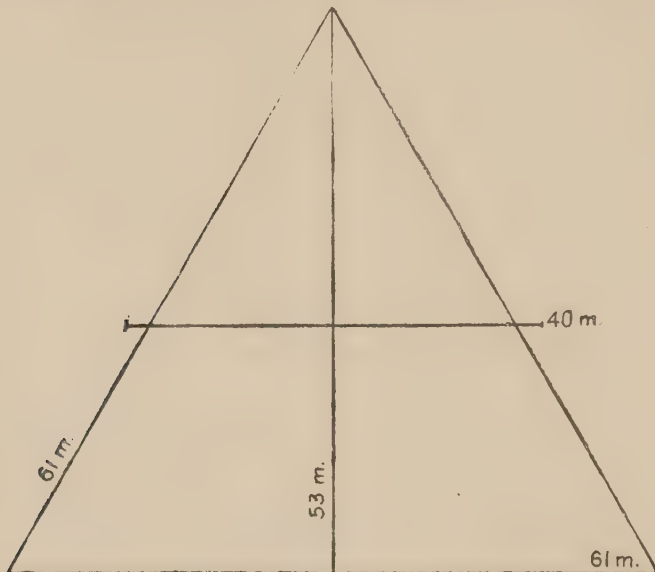


owing to extreme shortness and breadth of arch, the line falls very much beyond the triangle. Again, it will be observed that whilst the dolichoid antero-posterior measurement is but little if any less than an average arch, the brachoid arch gives a similar line very much below the average.

### 3. MACROID JAW (*Μακρὸς*, *large*).

*Definition.*—A term applied to an upper jaw in which the measurements of the arch, though relatively to each other normal, are yet absolutely

greater than the average standard, the palate, moreover, being the seat of well-marked deformity. The true macroid jaw is comparatively rare, and is invariably found associated with some other abnormality. Beyond its size, it presents but few points of interest, the palate chiefly claiming attention on account of its extreme vaulting. The dental arch is well formed, and the teeth

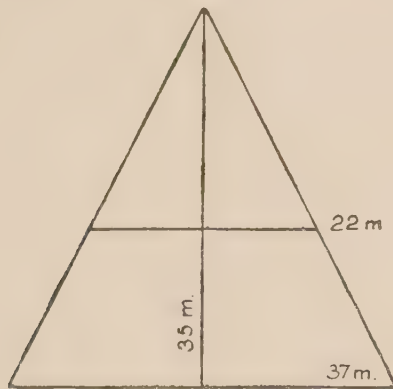


regular, but not large as compared with the general dimensions of the mouth. The most notable example that I have met with as illustrating the special features of the macroid class, is the case of Julia Pastrana, in which the base of the triangle gives a measurement of 61 m., whilst the interbicuspid lines reach the extraordinary length of 40 m. or 5 m. beyond the normal standard. My model is unfortunately not sufficiently perfect for me to take the palatine outlines.

4. MICROID JAW (*Μικρὸς, small*).

*Definition.*—A term applied to an upper jaw in which all the measurements are below the average standard.

But few words beyond those contained in the foregoing definition are requisite to describe the microid jaw. It is an ordinary upper dental arch,

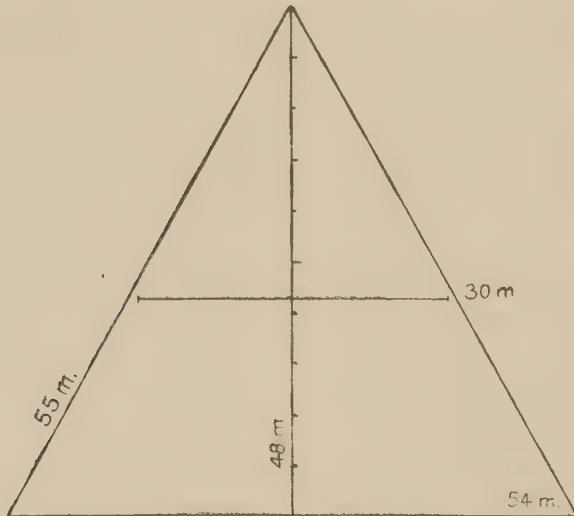


only very much in miniature, properly proportioned, and with fairly developed teeth, the palate deep apparently, but not really. There may be a small amount of lateral contraction, but not sufficient to destroy the symmetry of the arch.

Some idea of the size may be gained from the statement that in one case that I have measured (the patient being thirty-seven years old), the base line was only 37 m. as against 61 m. of the macroid, and the interbicuspid line only 22 m. long as against 40 m. of the macroid.

5. INTERMAXILLARY PROGNATHISM ( $\Pi\rho\acute{o}$ , *before* ;  
Γνάθος, the *cheek* or *jaw*).

*Definition.*—A term applied to an upper jaw, in which the dental triangle having been taken, the distance from the interbicuspid line to the apex of the triangle is greater than the normal standard, and also greater than the distance from the interbicuspid line to the base of the triangle, to



which it should normally be nearly equal. Thus, in a triangle having its vertical line divided decimally, the interbicuspid line falls a little over four-tenths from the base, giving six-tenths for the distance from the intercuspid line to the apex of the triangle.

The term prognathous is applied in anthropology to those skulls in which the projection of the upper jaw is excessive, and is accepted as a race-

characteristic. "All races, all individuals, are prognathous, the difference between them being only in degree: the natives of Europe, notably the Gauls, being least so, and the pure Hottentots reaching the highest maximum of the whole human race."\*

M. Topinard recognizes as true prognathism that which he calls alveolo-sub-nasal, limiting its area "to the portion of the maxilla subjacent to the nasal spine, which corresponds to the palatine arch, and that next to it in which the alveoli are situated."†

Applying the term to the purposes of a pathological classification, I have deemed it wise to limit still more the area to which it shall refer; hence the prefix, intermaxillary-prognathism. Still more shall I endeavour to justify the use of this prefix by arguing, further on, that the intermaxillary bone is an important factor in the production of the deformity. Briefly to describe a case: we find an elongated jaw with a small arch in the incisive region, with the molars and bicuspid implanted nearly in a straight line, and but slightly divergent on either side from the central line of the palate. The bicuspid and molars appear but a moderate distance through the alveoli, and the incisors and canines will be found separated from each other

\* Topinard, "Anthropology," p. 282. English Ed. 1878.

† Topinard, "Op. Cit.," p. 281.

by a varying amount of space, according to the age of the patient, the eversion of the teeth in late middle life being increased by mechanical causes operating on their primary displacement.

The alveolar arch will be observed in front as projecting abnormally, and retaining its marginal peculiarities, an important point to notice, as it enables us to diagnose with other symptoms between the prominent teeth of the thumb or tongue-sucker and the case of true congenital intermaxillary prognathism.

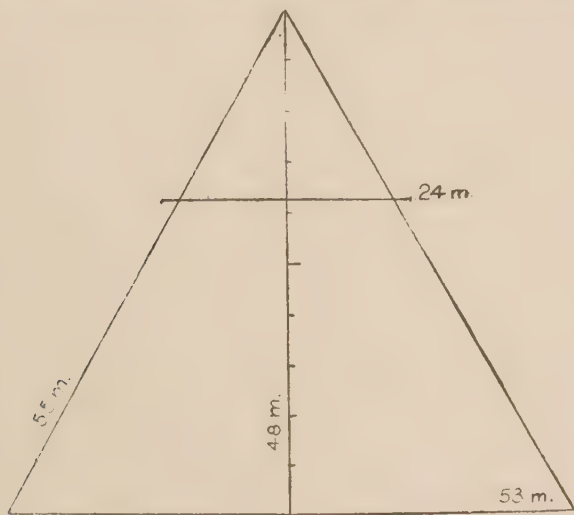
It might at first be supposed that the alteration in form was due to great lengthening of the jaw backwards, and projection of the teeth only, and that the prognathism of these cases was apparent rather than real ; but exact measurements from the triangle show that a typical case gives a remarkable resemblance between this malformed English jaw and a typically-developed Hottentot's jaw, the interbicuspid line in the abnormal arch falling a little over four-tenths from the base line, and in the Hottentot's jaw falling exactly four-tenths from the base line, thereby showing not only the similarity between the two, but also indicating the region in which the departure takes place from the normal English arch. As the posterior division corresponds, so we find the anterior measurements from the interbicuspid line to the apex of the triangle very nearly the same, that is, nearly six-tenths for

the intermaxillary prognathism, and fully six-tenths for the prognathous Hottentot.

The palatine arch does not call for any special description, as it displays no unusual features.

6. INTERMAXILLARY UPOGNATHISM ( $\Upsilon\pi\delta$ , *deficient, less than*;  $\Gammaνάθος$ , the *cheek or jaw*).

*Definition.*—A term applied to an upper jaw in which, the dental triangle having been taken, the interbicuspid line will fall far in advance of the normal distance from the base of the triangle, the four incisor teeth being crowded together, and the canines, by reason of the smallness of the anterior section of the arch, kept out of their normal posi-



tion. The dimensions of the case of upognathism that I have chosen for the purpose of description gives a base line, and sides of the triangle, almost identical with that obtained from the prognathous

jaw described in the last section. The points of difference will, therefore, be more readily appreciated, as the decimal measurements from base to apex are the same.

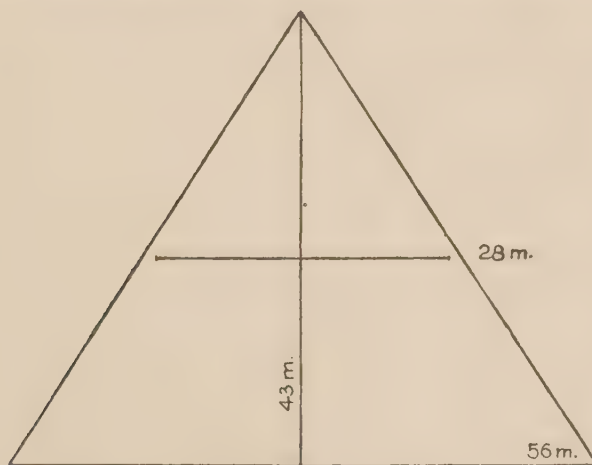
The upognathous jaw is one in which we find the bicuspid and molars occupying a fairly normal position, but the centrals very close together, and the lateral incisors almost immediately posterior to them, the canines standing outside the arch and in part filling up the gap between the bicuspid and central incisors. The vaulting of the palate is considerable, its lateral walls approaching the vertical, whilst its antero-posterior outline gives an index of the depth of the alveoli and the abruptness of the curve. All the characteristics are probably exaggerated in the present case, on account of the large size of the teeth, and the very pronounced development of their investing alveoli. Yet, making allowance for these sources of error in estimation, sufficient remains to enable us to obtain adequate data for the purposes of the present classification.

Referring then to this obtained triangle we find that whilst in the intermaxillary prognathous jaw we obtained an interbicuspid line falling a little over four-tenths from the base line; in the intermaxillary upognathous jaw we have the interbicuspid line falling rather more than six-tenths from the base line. Or, putting the case the other way, we have in the

prognathous jaw the apex six-tenths in advance of the interbicuspid line, whilst in the upognathous jaw we have it only a little less than four-tenths, thereby showing the excessive development with interdental spacing in the one, and the diminished development and interdental crowding in the other; whilst the interbicuspid measurement (only 24 m.) shows the contraction of the arch owing to the diminished size of the intermaxillary region.

### 7. LAMBDROID JAW ( $\Lambda$ , *lambda*).

*Definition.*—A term applied to an upper jaw in which the outline of the dental arch and the sections of the palate resemble the form of the Greek letter *lambda* and present a wedge-like appearance.



Under the name of V-shaped arch we have hitherto included those cases of deformity of the upper jaw that are regarded as being specially associated with a very low mental development.

whilst, as I have shown in an earlier part of this paper, the term was allowed to include a number of conditions that the name did not in all cases indicate or fairly represent.

In the six classes of abnormal jaws that I have already described, I have included, under a precise name, most of those that have been hitherto referred to under the more general term of V-shaped, but we still have one very pronounced form of abnormality that requires a special description. If the jaw were looked at upside down the term V-shaped would properly describe it, but looked at in the ordinary way it corresponds in outline with the Greek *lambda*, and hence I propose the adoption of this name, first, as being diagrammatically more appropriate; and, secondly, from its Greek origin offering greater uniformity with the titles of the first six classes enumerated. I have intentionally left the description of the alphoid jaw till the last, as, whilst all the other classes have their parallels in normal jaws, in form if not in degree, the lambdoid jaw is a class alone, without normal parallel, and doubtless the product of profound central lesions during early embryonic life.

The outline it presents I have already mentioned; beyond this we have to note the large size of the teeth, the prominent markings of the mucous membrane, and the diminished interbicuspid measurement,—thus, in a typical case we have a base

line of 56 m., a length of 43 m. from base to apex of triangle, and an interbicuspid measurement of only 28 m., falling within the sides of the triangle; the central and lateral incisors semi-rotated, and the palate presenting the typical wedge-shaped outline, the vertex being above the normal plane, and the soft palate too short to touch the posterior wall of the pharynx. Although it is not essential to idiocy that this deformity should exist, still it is tolerably certain that the lambdoid arch is rarely seen except in connection with low mental development, and especially where the idiot is microcephalic.

Without entering upon the much-vexed question of the proofs of congenital idiocy, it may yet be well to say that such cases rarely, if ever, occur without showing some deformity of the jaw, if sufficiently accurate dental observations be made to ascertain the fact.

Having thus endeavoured to justify the expediency of the classification that I have brought forward, I propose now, as briefly as possible, attempting to give an explanation of the origin of those lesions to the enumeration of which I have devoted this paper, stating at once, however, that whilst hitherto I have confined myself as strictly as possible to a bare recital of observable facts, I shall now pass on to a more speculative series of remarks.

I must confess I am unable to explain at present the origin of the Dolichoid and Brachoid jaws. The investigations that I am still carrying on will possibly at some future time enable me to throw light upon the subject, but as yet my views are not sufficiently definite to be of any value. It would be easy to say the changes in form are due to premature synostosis ; that would doubtless give a well-known name to the process, but it would not at all explain the origin of the process, or why the ossification should take place in one direction rather than another. The whole of this question, as with the macroid and microid jaws, bears an intimate relationship to general cranial morphology, and for that reason I must defer any attempted explanation of the origin of a set of deformities, in connection with which we can at present deal only with processes and results, and not with original causes.

In regard to the prognathous and upognathous jaws, we are in a somewhat more satisfactory position, and although I would not presume to speak with authority, yet I trust I may be able to put forward a case with such a show of reason as shall at least command further and patient investigation.

My first assertion is this, that the deformity known as *intermaxillary prognathism* is the result of a force operating on the intermaxillary bone,

such force originating in the body of the sphenoid, and being transmitted by the intervening nasal septum. (I may at once say that when speaking of *force* I mean a direction of growth in a given line of such energy as to overcome the resistance offered to it by surrounding structures.)

The foregoing assertion is based upon the interpretation of the following observed facts:—First, the true case of intermaxillary prognathism will have a long thin nose. Secondly, this long thin nose is not observable during the first dentition, nor is the prognathism, excepting to a very slight degree indeed. Hence we may conclude that the long thin nose and prognathous jaw are capable of intensification by growth and development during early life. Thirdly, it has been shown that the measurement from the interbicuspid line to the incisive angle is greater in the prognathous than in the normal jaw: hence it follows that the change from the normal arch occurs at a point anterior to the second bicuspid, whilst the second bicuspid is known to correspond with the position of the second molars of the milk dentition. Thus it is shown that the prognathism is not of the whole jaw carried forward on a horizontal plane, but is really intermaxillary or alveolo-sub-nasal in its character. Fourthly, it is a simple logical sequence of the process that produces intermaxillary

prognathism, carried a step further during embryonic life, that produces double hare-lip and fissured alveolus. The specimens in the Royal College of Surgeons and the illustrations in our standard works on surgery, as well as the plates published by Von Ammon and Vrolik, amply prove that in double hare-lip the intermaxillary bone is carried forward by the vomer and the rest of the nasal septum ; and in many cases we know this is removed by the surgeon in operating for hare-lip, and we obtain afterwards the grooved centre to the alveolus with two canines, one on either side of the termination of the true maxillary process.

Arguing back from these cases of double hare-lip to pre-maxillary prognathism, we can come to no other conclusion than that the duration and extent of the force operating upon the intermaxillary bone determines the nature and extent of the deformity that will be produced. I shall doubtless be met with the assertion that as the prognathism is not pronounced in early life, and as the union of the intermaxillary bones with the true maxillary bones is complete at this time, therefore it is impossible that the inter-maxillary bone can be the subject of any subsequent change. Against this objection, I may say that as I have shown that intermaxillary prognathism is but a preliminary step in the deterioration

of form that will produce in a subsequent generation (subjected to like conditions of propagation) double hare-lip, so we may assume that the general cranial development will in the two cases bear some relation to each other; and that as we know (on the authority of Hutchinson) that in cleft-palate cases ossification of the sutures is delayed to a period far beyond the usual date, so in cases of intermaxillary prognathism the sutures would not be so much ossified as to oppose any sufficient resistance to the exercise of the force originating in the sphenoid,—a force that I at first asserted was the cause of the prognathism. From collateral evidence we know that many cases of prognathism are associated with such central lesions as will manifest themselves in the form of idiocy or imbecility; and further, that the general configuration of the face is ape-like, from its diminished facial angle and retreating chin; and we also know that in the apes the intermaxillary suture is not ossified till late in life, nor is the prognathism developed till after the primary dentition. Still further, we have it on the authority of Topinard that the skulls of the Merovingian race are the most prognathous of any found in France; and next we have it on the authority of French historians that the Merovingian dynasty was so debased in physical and mental development as to be known in their latter days as *les rois fainéants*.

It will, therefore, scarcely be straining the argument unduly if we assume that as man by deterioration returns to the type of the higher apes ; so, by the like process, he will in his method of development be subjected to similar conditions of growth and ossification. I do not, of course, wish it to be understood that all who have intermaxillary prognathism must of necessity be either idiots or imbeciles ; but I desire very distinctly to assert that such a deformity occurring amongst the highly civilized is a distinct mark of deterioration of stock, whilst it is differentiated from the normal prognathism of the Hottentots by the diminished interbicuspid measurement of the highly-bred skull.

Intermaxillary upognathism is not so easily to be accounted for. It occurs in the offspring of apparently the robust ; but I think more extended observation will probably show that there is a scrofulous tendency on one or both sides of the ancestral tree, not that we have any very pronounced symptoms, but judging from the liability of the patient to certain diseases.

Thus we shall often find fragile nails, delicate hair, clear complexion, great physical beauty, combined with a constant tendency to disease of the tonsils, general relaxation of the mucous membrane, disease of the joints, and liability to phthisis. The facial angle will be good, and the chin pro-

nounced in character, the lips will rarely be shut, thereby indicating the post nasal interference with respiration, and the nose will be either symmetrically small or divinely tip-tilted. Looking at the face as a whole, we should say that the nose was too small and the lips were too short, or that the rest of the face was too large for these two features. It really is the nose and mouth that are too small, and as we saw in the prognathous class deformity due to excessive development in this region, so we see in the present case deformity due to deficient development.

As to the primary cause of either the one or the other, we are I think completely in the dark. From the sociological point of view, upognathism is not such a serious matter as prognathism, for I have endeavoured to show that the one indicates a deterioration of stock that is in all probability progressive, whilst the other arises from a robust stock subjected to certain unfavourable influences that may from their nature be sooner or later eradicated.

The Lambdoid jaw, or V-shaped arch, as it has hitherto been called, seems to combine most of the features of deterioration that I have taken as class distinctions in the other varieties. Thus the triangle is somewhat below the average from base to apex ; the base is beyond the proportionate length ; the interbicuspid line falls within the

triangle ; and the general appearance of the front of the mouth is prognathous. This last condition is not, however, real, but simply apparent, owing to the peculiar arrangement of the teeth in their sockets, and not owing either to local or general prognathism of the jaw.

Although there is little question that all the other forms of jaw that I have described may be, and probably are, found in connection with congenital idiocy, yet it seems probable that this lambdoid jaw is connected with the most pronounced type of idiocy, namely, the microcephalic.

After carefully examining the works of various writers on the subject of microcephalic idiocy, there seems sufficient evidence to justify the belief that premature ossification of the sutures is the rule in the majority of these cases ; and we may, therefore, assume, if we cannot absolutely conclude, that this influence operates powerfully in the production of the dental deformity known as the lambdoid jaw ; and this view is held by Virchow, but it is combated by Dr. Langdon Down and Dr. Ireland.

It would be extending the present paper beyond its proper scope were I to enter into the many interesting points opened up by the discussion of the present subject ; I must, therefore, leave them for some future occasion.

In conclusion, I have to thank my friend Mr. Charles Tomes for the assistance he rendered me in discussing the chief points of this paper prior to its presentation to this Society, and for some valuable suggestions as to the lines upon which further investigation might be pursued; whilst to Mr. Willoughby Weiss I am indebted for the help he gave me in preparing my series of tracings of the skull.

---

The PRESIDENT said they had to thank Mr. Coles for a very original and carefully-prepared paper. Unfortunately, the time usually occupied by the meeting had nearly expired, he would, therefore, put it to the members present whether they would prolong the meeting or adjourn the discussion to another evening?

Mr. WEST said that he was in favour of the adjournment of the debate. He had received his copy of the *Transactions* only that morning, and not having had time to look at it, did not know when he came to the meeting what the subject of the paper was to be. He believed that it would be impossible to discuss Mr. Coles's paper profitably without having some opportunity for study and reflection.

Dr. WALKER said that with regard to what Mr. West had said respecting the late delivery of the *Transactions*, it must be remembered that the last meeting took place unusually late in the month (on the 12th) whilst this one was very early; the time available for the preparation of the *Transactions* had, therefore, been shorter than usual. With the rest of Mr. West's remarks he perfectly agreed, but he had to remind members that Dr. Lander Brunton had promised to read a paper at the next meeting, the discussion on which would probably fully occupy the usual time; he, therefore, proposed that the discussion of Mr. Coles's paper should be adjourned until the April meeting.

MR. J. S. TURNER said he would cordially second Dr. Walker's proposition. Mr. Coles's paper dealt with a subject of considerable importance, and the paper itself was important from the amount of thought and labour which had been bestowed upon it. It appeared to provide a most useful system of nomenclature, and the deductions which Mr. Coles had drawn from his carefully elaborated facts were of the greatest interest. It was impossible to discuss such a paper offhand, and he was decidedly in favour of the adjournment till April.

The PRESIDENT said that Mr. Coles's treatment of his subject was certainly novel, and the paper, dealing with a large number of facts and figures, was altogether a difficult one to follow. He thought that careful reading and study would greatly facilitate its proper discussion, and had therefore great pleasure in putting Dr. Walker's motion to the meeting.

The motion, "That the discussion on Mr. Oakley Coles's paper be adjourned until the April Meeting," was then put, and carried.

On the motion of the President, the thanks of the Society were voted to Mr. Oakley Coles and to the other contributors during the evening.

The PRESIDENT then announced that at the next meeting Dr. Lander Brunton would read a paper on "Nervous Diseases Connected with the Teeth."

The meeting then terminated.

---







Photograph of a Hindoo bas-relief, representing a group of monkeys engaged in extracting a man's tooth. The unfortunate individual was bound, and the tooth was held in the grasp of a very primitive-looking extracting instrument, to which a small elephant was attached by means of tackles. This piece of sculpture was found in a ruined temple near Allahabad, known as the Stupa of Bharhut, and was more than 2000 years old, the temple having been built about the year 300 B.C.





## ORDINARY MONTHLY MEETING.

*March 1st, 1880.*

ALFRED WOODHOUSE, ESQ., PRESIDENT, IN THE CHAIR.

---

THE Minutes of the previous Meeting having been read and confirmed,

Mr. JAMES MERSOM signed the Obligation Book, and was formally admitted to Membership by the President.

The following candidates were then separately balloted for, and were all elected members of the Society, viz. :—

W. A. MAGGS, L.D.S. Eng., 12, Albert Street, Regent's Park ;

GEORGE PEDLEY, M.R.C.S. Eng., 30, High Street, Borough ;

FRED. JOSEPH BENNETT, M.R.C.S. Eng., 17, George Street, Hanover Square, as Resident Members : and

CHARLES FARNSWORTH, L.D.S. Ireland, Oxford Street, Manchester ;

ARTHUR TAYLOR, L.D.S. Eng., Belle Vue Terrace, Belle Vue Road, Leeds ; as Non-Resident Members : and

JOSEPH ISZLAI, M.D., M.S., &c., of Buda Pest ; as Corresponding Member.

The PRESIDENT announced that Mr. Leonard Matthison, of Oxford Road, Manchester, had been duly proposed as a candidate for membership, and would be balloted for at a subsequent meeting.

Dr. WALKER then read the following communication :—  
With your permission, Mr. President, I will allude to the fact that in daily practice we are frequently called upon to give an opinion as to the probable duration of a swelling in the maxillary region. The following case may prove to us how hazardous a hasty opinion may prove to be :—

A man, aged 35, consulted me, but apparently with great repugnance and indifference, stating even before he had made a foot's entrance into my consulting room, that if his medical man had not refused attendance until he had consulted a surgeon of our speciality and supported this by a threat of discontinuing his treatment altogether, he would not have come to town, as his teeth had been examined many times before and found quite sound.

On inquiry, I ascertained from the patient that twelve months previously he had experienced great pain in the left side of his face and head. After a few days this was followed by throbbing and dull heavy pain in the whole of the superior maxillary region. In a few weeks from the date of the first attack pain in the left ear and the region of the temporal bone supervened and continued for weeks, with swelling over the mastoid cells under the sterno-mastoid muscle ; resulting in due time in a large abscess, followed by several smaller ones, in the same region ; debility, and weakness of the general constitution, consistent with the formation of pus. This was succeeded by occasional indistinct vision in the left eye, which increased until he lost the sight.

He had taken several months' rest with total cessation of all business and frequent changes to the seaside, but with no beneficial result.

On examination, the left eyeball was of a different colour to the right : there was no apparent swelling in the region of the superior or inferior maxilla. There were cicatrices over the mastoid cells, but no accumulation of pus.

The hard palate appeared quite healthy ; there was slight redness around the margins of the first and second molars ; only very slight fulness between the facial muscles and the maxillary

bone ; no tenderness on pressure. On careful inspection and examination of the teeth, with the assistance of the mouth-mirror, all the teeth appeared sound. No discoloration was apparent, even with a strong reflected north light. On digital examination (with the head firmly grasped) all the teeth were quite firm, except the second left upper molar. In this tooth I could feel distinct motion, but with no visible signs of elongation. On introducing a hard substance between the upper and lower teeth, and applying severe pressure by the heavy closure of the jaws, the second molar jaw gave no signs of tenderness. By isolating the second molar with prepared cotton-wool placed around the other teeth, and the injection of cold water with a large syringe, a paroxysm of severe pain was the immediate consequence. On extraction of this tooth, one ounce of pus passed into the mouth through the palatine socket. In this case, the palatine fang of the second molar had perforated the floor of the antrum ; obscure caries on the posterior proximal surface of the tooth had generated pus, which accumulated in the antrum, then passed back through the vidian canal, hiatus fallopii, and aqueductus fallopii to the ear, and under the sterno-mastoid muscle, pointing to the surface. Or, by absorbing a portion of the hard palate, the pus might have passed through the posterior palatine canal into the spheno-maxillary fosse, then through the spheno-maxillary fissure. The patient made a good recovery, with perfect restoration of sight

The PRESIDENT remarked on the interest of the case, and the difficulty of the diagnosis, and complimented Dr. Walker on the clearness with which he had demonstrated the probable course of the pus on his prepared specimens.

Mr. SEWILL said there was one statement in the very interesting communication which Dr. Walker had just read which he was not disposed to accept without further evidence, viz., that the pus did actually travel to the petrous portion of the temporal bone by way of the canals which Dr. Walker had enumerated. He thought it much more probable that the

pus had passed along the bones externally, burrowing in the usual way under the muscles and fascia; especially since there had been no interference with the function of hearing, which would probably have happened had the bone been the seat of an abscess. So also he thought that the effects on the eye might be more easily explained by supposing that the pus in the antrum had exerted upward pressure on the floor of the orbit, rather than by the actual presence of pus in the orbit. Had this been the case, considerable disorganization of the contents of that cavity must have resulted, and there would not have been such a rapid recovery after the evacuation of the matter; whilst, on the other hand, very similar symptoms might be observed as the result of pressure in cases of tumour of the antrum. But these criticisms did not in the least diminish the interest of the case, nor could they lessen the credit due to Dr. Walker for having correctly diagnosed such an exceedingly obscure case.

Mr. GADDES remarked that the influence of the nervous system in exciting purulent secretion on parts remote from one another must not be lost sight of. It might be that in this case the presence of pus in the neighbourhood of the ear had been due to the transmission of a reflex nervous impulse, and not to the actual travelling of matter from the superior maxilla to the temporal bone.

Dr. WALKER said that a detailed reply to Mr. Sewill's criticisms would take up more time than could be spared that evening; but he might state that this was [not the first case of the kind which he had met with. On several occasions, patients had been sent to him by ophthalmic surgeons, who had detected the presence of pus in the orbit, and had found it to be due to disease of the teeth or palate. He would, on a future occasion, give particulars of four or five cases in which pus had travelled to considerable distances through the bony canals of the skull, and he thought he should be able to convince Mr. Sewill that what he had supposed to have occurred in this case was neither impossible nor improbable.

Mr. MAGOR showed a left upper wisdom-tooth which had been sent by his father for presentation to the Museum. It was very small and deformed, resembling a supernumerary, rather than a third molar. The patient, a lady of about 40 years of age, had suffered for some time from severe neuralgia of the left side of the head. This tooth was found to be carious ; it was extracted, and the pain ceased.

Mr. BROWNE MASON then related the following case :—A young man running across a wet lawn slipped and fell with great force, striking his upper incisors on the edge of a stone step. When he came to Mr. Mason the left upper central was found to have been driven quite up into the alveolus ; the right central had a portion of its crown broken off ; the outer plate of the alveolus was fractured from canine to canine ; the left lateral, although still in its socket, was so loose as to threaten to fall out on the slightest touch, and the other incisors were very loose. Mr. Mason brought down the central incisor with a small pair of forceps, and obtained a very fair impression of the whole upper jaw in godiva wax, taking care that the teeth should not leave their sockets during the operation. He then made a temporary splint of the same material to keep the teeth in place during the three hours necessary to produce a splint of celluloid. This was made to fit closely to the lingual and labial surfaces of the incisors and canines, and passed back and round the last tooth on each side of the jaw ; it was retained by ligatures tied to the second bicuspid on the one side and to the first (the second being absent) on the other. The accident occurred on February 18th, and the patient had since progressed very satisfactorily ; of course he was still wearing the splint, and would continue to do so until the teeth were quite firm in their sockets.

The PRESIDENT then called upon Dr. Lauder Brunton to read his paper.

*On Nervous Diseases Connected with the Teeth.*

By T. LAUDER BRUNTON, M.D., F.R.S.

MR. PRESIDENT AND GENTLEMEN,

THE pain of toothache localised in a decayed tooth is unfortunately so common that every sufferer diagnoses it for himself, and although it may be reckoned amongst the nervous disorders connected with the teeth, I need not say anything about it.

But toothache may be associated with other pains, or may even be replaced by them, and then the diagnosis is by no means so easy. The true cause of the pain may, indeed, remain unsuspected even by competent medical men, and their treatment may consequently be comparatively ineffectual. My attention was first drawn to the connection between decayed teeth and nervous disorders having little or no apparent relation to them by an incident which occurred a good many years ago, when I was a student. I had just heard that one of the best means of relieving toothache was to insert a pledget of cotton-wool, dipped in melted carbolic acid, into the cavity of the aching tooth, care being, of course, taken to

squeeze out the superfluous acid, and to cover the pledget with some clean wool, so as to protect the tongue. I was very anxious to test the information I had received, and shortly afterwards an opportunity presented itself. A maid-servant had complained for some days of headache in the left temple of a severe neuralgic character, and associated with this was a certain amount of toothache, which was, however, less complained of than the headache. I plugged the offending tooth with cotton-wool dipped in melted carbolic acid, but was greatly disappointed to find that it produced little or no apparent benefit. In less than half-an-hour, however, the girl informed me that the pain in the temple and the toothache were both entirely gone. Their disappearance was not due to the carbolic acid having required time to exert its action, but to its having been applied to a different point. The girl had taken it out of the cavity of the decayed molar into which I put it at first, and transferred it to another tooth, of which she had not complained, and which I had not suspected. Immediately the pain disappeared, both from the tooth and the temple.

In this case pain was felt in the tooth as well as the head, and the headache might be looked upon as simply irradiation of the pain from the tooth. But that headaches may occasionally depend upon caries of teeth in which no pain

whatever is felt, is, I think, shown by what once happened in my own case. I had been suffering from migraine, the pain being limited to a spot in the left temple. There was tenderness on pressure on one spot below, and in front of, the parietal eminence. On several occasions I had noticed that the left eyeball was tender on pressure; but one day I was suffering from headache, and yet found that the eyeball was not tender. I pressed my finger all over my face in the endeavour to find a second tender spot, and at last I found one under the angle of the jaw. But the tenderness here was due to a small gland, which was hard and painful to the touch. Hardness, enlargement, and tenderness in a gland generally indicate more or less inflammation in it, and the most probable cause of such a condition is, of course, the irritation excited in the gland by foreign matter conveyed to it by the lymphatic vessels. I accordingly began to examine the mouth and teeth from which the lymphatic vessels proceeded to the gland in question. Nothing abnormal was to be noticed in the lips, cheeks, tongue, or gums, so I tested the teeth by percussion with a blunt steel point, and on the posterior aspect of the last molar on the left side of the lower jaw I found a spot which was very slightly tender. I accordingly went at once to a dentist, and learned that caries had just begun at that

spot, but had not caused any cavity whatever. I had never suffered the least pain in the tooth, and but for the headache which led me to percuss the teeth systematically I should in all probability never have suspected the caries until it was far gone. The connection which was here found to exist between temporal headache and a decayed tooth is, I think, interesting, not only as showing a causal relation between the caries and the headache, but as helping to explain the pathology of migraine.

A good deal has been written on this subject, and there is a considerable diversity of opinion amongst different writers. Professor Du Bois Reymond, who suffered a good deal from it, attributed it to spasm of the vessels, for he found that, during the pain, the temporal artery became tense and hard, like a piece of whip-cord, and the pupil of the eye on the affected side dilated as if the sympathetic in the neck had been irritated. Others have discarded this explanation, because they found that the vessels, instead of being firmly contracted, were distended widely, and throbbed violently, and they have attributed the pain in the head to the congestion of the vessels.

These two explanations of the pain of migraine, the one attributing it to anæmia, and the other to congestion, are apparently irreconcilable. My own case gives, however, I think, an explanation

of the discrepancy. Both statements are correct, but both are incomplete, and the reason is that their authors have only observed the arteries during a part of their course, instead of tracing them backwards to the large trunks from which they sprang, and onwards to their smaller ramifications. In my own case, I have found that on some occasions the temporal artery was hard and contracted, like a piece of whip-cord, as described by Du Bois Reymond. On others I found the temporal artery widely dilated, and pulsating violently, and yet I could distinguish no difference between the pain I felt on these different occasions. So, not contented with noting the condition of the temporal artery only at its middle, I followed it onwards to its smaller branches, and backwards to the carotid.

Then I found that a constant vascular condition existed during the headache, notwithstanding the apparent differences in the state of the temporal artery. This constant vascular condition consisted in dilatation of the artery at its proximal, and spasmodic contraction at its distal, extremity. The carotid artery was almost invariably dilated and throbbing. Sometimes the dilatation would extend as far as the trunk of the temporal artery, but sometimes the temporal was contracted. Even when the temporal artery was dilated, if one only followed it to its smaller ramifications they

were found to be firmly contracted and cord-like. If one may reason from this single instance, connecting as it does the examples of vascular dilatation and contraction given by other authors, we may say that the pain of migraine depends neither on contraction nor dilatation of the vessels *per se*, but upon dilatation of the one part of the vessel with spasmodic contraction of another, or, if we might so term it, upon a state of colic in the vessels themselves. This irregular contraction of the vessel is almost certainly due to disordered vaso-motor innervation. The cause of this disorder is to be sought in the sympathetic system, and the observation of Du Bois Reymond regarding the condition of the iris may lead us to connect it with the cervical ganglia. From these ganglia vaso-motor fibres proceed along the carotid and its branches, and if we regard disorder of these ganglia as the cause of migraine we are at once in a position to explain some of the symptoms which occasionally accompany it. Thus, I have observed that sometimes the pain in the temple would suddenly cease, and be replaced by pain in the occipital region. Sometimes, also, we have affections of the sight, such as general dimness of vision, diplopia, and spectra—coloured or uncoloured. The transference of pain from the temple to the occipital region is probably caused by transference of the spasmodic contrac-

tion from the temporal to the occipital artery, and the disorders of the sense of sight we may reasonably regard as caused by alterations in the intercranial branches of the carotid, similar to those which we can detect by the finger in its temporal branch. The disturbance in the sympathetic system, which I regard as the cause of migraine, may not always have its origin in the teeth; it may, and very probably does, sometimes originate in the eyes, but in the instance which I have already noted as occurring in my own case, the irritation started from the lymphatic gland, on or about which branches of the sympathetic probably ramified. The tooth itself, although the real cause of the sympathetic irritation, did not produce it directly, but indirectly. From the root of the tooth the lymphatics conveyed irritating matter to the gland, and the irritation here excited acted in its turn as a disturber of the sympathetic nerves which furnish the vaso-motor supply to the carotid and its branches.

The connection between dental caries and neuralgia was first noticed by Neucourt,\* and he gives rules for diagnosing a causal relation between caries and neuralgia. When the pain, which is at first widespread, gets localized, in the course of a few days, in the dental region,

\* F. Neucourt "Arch. Gén.," Juin, 1849.

and is succeeded by redness, swelling, and tenderness on pressure of the gums, the neuralgia is almost certainly of dental origin. In these cases the patients are restless, and the pain is more or less constant, with no distinct intermissions; the pulse is more frequent and hard, and there is not unfrequently sweating. If the pain is followed by a gumboil, the tooth, he thinks, is certainly decayed, although it should present no appearance of caries, and this he considers to be also the case if the tooth appears longer than the others and is painful on percussion. Tenderness on percussion is considered by Richter\* to be the most certain sign. The diagnosis may be assisted by noticing whether the neuralgia when disappearing lingers longest in one of the teeth.

The exact pathology of neuralgia has not yet been settled, but Valleix, one of the great authorities on the subject, gave as its distinctive points the presence of spots which were tender on pressure, and the effect of pressure in increasing the pain. These spots have been noticed by Neucourt† in neuralgia depending upon dental irritation, and he has also observed the absence of increased pain on pressure in true neuralgia, so that no distinction can be drawn between neuralgia due to

\* Richter Schmidt's "Jahrbucher."

† F. Neucourt "Arch. Gén.," Oct. to Dec., 1853; Jan., 1854.

dental irritation and neuralgia depending upon other causes.

Although the most frequent seat of pain due to carious teeth is the temporal region, yet, as one would expect, we find it also in parts of the neck. A few weeks ago I was consulted by a lady regarding her throat. She had pain opposite the upper part of the thyroid cartilage on the right side, and thought that she had inflammation at that point. Laryngoscopic examination showed the larynx to be perfectly healthy, but I found one of the molars on the same side as the painful spot to be extensively diseased. The pain from which she suffered, I have little doubt, was caused by the decayed tooth ; but, as she refused to have it extracted or stopped, I could not absolutely verify my diagnosis. I put her upon a course of tonics and the pain almost completely disappeared.

This would be said by some to prove my diagnosis to be wrong ; for if the pain depended on the presence of a carious tooth, how could it disappear while the tooth remained unattended to ? But we must always remember that the actions which take place in the animal body are not so simple as those which occur in the test-tube of a chemist. Yet even in the test-tube we require more than one reagent to produce a reaction ; and if one of the substances or conditions necessary for the re-

action be absent, it does not occur, even though other conditions be present. In the same way we know that a decayed tooth does not always cause toothache, and that toothache, when present, may frequently be removed by the use of a saline purgative. The tooth still remains as a source of irritation, but the state of the nervous system has been so altered by the purgative, that pain is no longer produced by the irritation. In the same way we may not unfrequently relieve the neuralgia originating from decayed teeth by a judicious course of aperients and tonics. This is so far advantageous to the patient, as it relieves him from pain; but it is, on the other hand, disadvantageous, inasmuch as it causes the medical man to overlook the real source of the evil, and allows the dental caries to proceed instead of having it arrested by suitable stopping. In the case I have just mentioned, the pain in the larynx, which I attributed to the decayed tooth, did not lead to any change in the nutrition or functions of the larynx. Pointis,\* however, records a case in which, after severe toothache, the patient suddenly lost his voice, and the aphonia was followed by anorexia, cough, wasting, and feverishness, which led to the belief that he was suffering from laryngeal phthisis. But the lungs were sound, and there was no

\* Pointis, "Journ. des Com. Méd. Prat.," Sept., 1846.

tenderness over the larynx. There was slight inflammation of the pharynx and all the molars on the left under-jaw were decayed, and the gums and periosteum around them were swelled. The teeth were removed, the gums cauterized, and gargles employed. On the very day the teeth were extracted, the suffocative spasms which had troubled the patient abated, and on the following days the other symptoms quickly disappeared.

The irritation caused to the larynx by the process of dentition is well recognised, and has led to the employment of the term teething-cough. The existence of a real causal connexion between cough and teething has been doubted; but there are cases on record which seem to show that this really does exist. One very marked instance of this sort has been recorded by Paasch.\* A child, four months old, had a paroxysmal laryngeal cough, during which it was nearly suffocated, opening its mouth and throwing the head back. Narcotics were of no use. The gum of the lower jaw was swelled, and vesicular swellings appeared at the part of the gums corresponding to the middle incisors. These increased in size and became dark, livid, translucent, and fluctuating. During their growth, the cough increased; but when the right incisor came through the gum, and one vesicular

\* Paasch, "Journ. of Kinderkr," 3, 4, 1856.

swelling broke, the cough ceased. After twenty-four hours it again began, though less violent than before. After some days the second incisor came through, the second vesicle burst, the cough at once began to disappear, and at the end of two days had entirely and for ever gone.

From the close connection that exists between the throat and the ear we would expect deafness to be not unfrequently the consequence of dental irritation. It seems, however, not to be very frequent, although it does exist, as shown by the following case recorded by Koecker.\* A man, aged forty-eight, suffered from suddenly-increasing deafness ; but after his teeth, which were carious, and had caused suppuration of the gums, were extracted, he completely regained his hearing.

The eye is much more frequently affected than the ear, and blindness is by no means an uncommon result of dental decay. Mr. Jonathan Hutchinson has recorded some cases of this, and he regards the blindness as reflex, and analogous in its causation to essential paralysis of children. The sight is suddenly lost, but there are no cerebral symptoms. The optic nerve is sometimes atrophied, but sometimes not. The blindness is generally preceded for a long time by facial neuralgia, associated with toothache. A

\* Koecker, "Med. Chir. Rev.," Jan., 1843.

more striking case than any of Mr. Hutchinson's is recorded by Dr. De Witt.\* A perfectly healthy man, aged thirty - one, suddenly noticed, in attempting to fire off a gun, that his right eye was completely blind. He had neither pain nor subjective appearances of light in the eye. He was able to distinguish light from darkness with it, but nothing more. No cause for this blindness could be discovered until twelve years afterwards, when it was found that the patient had several teeth stopped two months before his blindness. For a long time afterwards he suffered from pain and tenderness in the first molar of the right side. The gums swelled and ulcerated, and frequent abscesses formed, which he opened with his knife. The stopping was at length removed from the tooth, and this at once relieved the irritation of the gums, and increased the power of sight. In three weeks, however, when the sight had already become considerably better, the gums again ulcerated, and the sight became immediately worse. The decayed tooth was then extracted, and the sight became permanently improved, although it never became quite so good as that of the other eye.

The connection between the teeth and the sight has been long popularly recognised in the name of "eye-teeth" given to the canines, and this seems

\* De Witt, "American Journ., N.S.," ex., p. 382, April, 1868.

to depend on no popular superstition, but on a real scientific fact. It is believed by many that the extraction or decay of a canine leads to loss of sight, or inflammation in the corresponding eye, and the physiological experiments of Magendie and Schiff substantiate this belief.

Magendie divided the inferior maxillary branch of the fifth, and Schiff divided the lingual and inferior dental branches without injury to the ophthalmic branches.\* The dimness of vision

\* Magendie, in 1838, showed, in one of his lectures, a small dog, in which he had divided the inferior maxillary branch of the fifth nerve some time previously. "Hitherto," he said, "only those parts were affected to which the branch was distributed; but in the present instance disturbances of the visual power had appeared some days ago. There was no such opacity as that which follows section of the fifth pair of nerves in the skull, but only a little cloudiness between the lamellæ of the cornea. Their transparency was not completely lost, but there was a condition intermediate between complete transparency and commencing opacity. It appeared to him, also, that the sensibility of the eyes was somewhat altered. When engaged in another research, I have divided, in a number of dogs, sometimes the lingual branch alone, and sometimes the inferior dental branch, high up at the point where it branches off from the inferior maxillary nerve. Since here the nerve was exposed and divided outside the skull, neither injury nor compression of the ophthalmic branch is to be thought of. No doubt, by my method of operation, traction was exerted on the inferior maxillary branch which was seized by the forceps; but the traction was exerted rather against the periphery than the centre, the dental branch being partly drawn out of its canal in the lower jaw. In most of the animals operated on, nothing remarkable was to be seen, but in about a third of them (four

produced by these experiments is referred by Schiff to disturbance of the vaso-motor supply

out of eleven) an affection of the corresponding eye appeared from four to eight days after the operation, without my being able to discover any reason for this peculiarity in the way in which the operation had been performed. The conjunc-tion became injected, and the injection went on increasing for two or three days, but never became so great as it does after division of the trigemenus. The eye was moist, and covered with a thin layer of the same mucus which is secreted so abundantly after paralysis of the ophthalmic nerve. The cornea did not become opaque, but exhibited a partial grayish dimness, which extended from the centre in irregular form, to a varying extent, sometimes towards the upper and sometimes towards the under edge. The eye exhibited no perceptible diminution of sensibility; the pupil remained perfectly mobile, and exhibited all the usual synergetic contractions on movement of the eyeball.

The dimness of the cornea increased for a short time, and in about twelve days from its commencement it disappeared completely, leaving the eye perfectly normal. During all this time the animals were perfectly lively, and their general condition underwent no change.

On what do these peculiar phenomena depend? Certainly on the weakening of the vaso-motor nerves in the district supplied by the ophthalmic nerve. But, as this nerve itself was not touched, some pathological process must needs have been propagated from the wound of the third branch towards the centre, and there have extended over the original district of that branch. This very general conclusion appears to me well-grounded; for I cannot believe that in these cases the hyperæmia of the eye on the side operated upon was due to chance, for this affection of the eye never occurred in any one of the numerous dogs which I kept under observation after other operations. The ophthalmic nerve here was not paralyzed, for the phenomena were not very intense, and the sensitiveness of the eye had not suffered.

to the eye, consequent upon a partial paralysis of the ophthalmic branch of the fifth;

The explanation of this was all the more obscure, as I had previously convinced myself that no pathological changes could be discovered by the microscope in the central end of the divided nerve. Besides, I had performed the same operation on the third branch of the trigemenus in a great number of cats, and no affection of the eye occurred in them. I therefore utilized the opportunity of studying more carefully the anatomical changes which are associated with this transitory condition, which was afforded me in 1852 by two young dogs, which exhibited this dimness of the cornea after resection of the inferior dental nerve. The dogs were killed from six to ten days after resection of the nerve. The swelling and alteration of the divided end of the nerve were no greater than is usually the case after such resections. There was, as usual, an exudation of nucleated globules between the nerve-bundles in the neighbourhood of the wound. Neither the inferior maxillary, higher up, nor the ophthalmic, exhibited anything abnormal under the microscope. A slight redness of the coverings of the nerve immediately below the exit of the third branch from the cranium could only be regarded as accidental, and perhaps due to the traction on the nerve trunk during the operation—and all the more as this redness was greater in the animal killed on the sixth day after the resection, and in which the dimness of the eye was less than in the dog killed on the tenth day. In both animals, it appeared to me that within the cranium the arachnoid covering the pons on the operated side, as well as the pons itself at the root of the fifth nerve, were more injected than on the corresponding parts of the other side. But any one who knows how inconstant and variable is the amount of blood inside the cranium will excuse me when I state this with considerable reserve. Both animals were killed with strychnine.” —Schiff, “*Untersuchungen zur Physiologie des Nervensystems mit Berücksichtigung der Pathologie.*” Frankfort, 1855, p. 112.

but as this nerve itself was not injured in the experiment, it is evident that the vascular alterations are of reflex origin, the irritation having been conveyed from the site of the wound to the nerve centres, and having there exerted such an influence upon them as to induce vascular changes in the eye.

The eyelid may also be affected reflexly from the teeth. Sometimes dental irritation may cause motor spasm, and at other times paralysis. A year or two ago I had the stump of a bicuspid tooth extracted from the right upper jaw. Almost immediately after the extraction I noticed a constant spasmodic twitching in the right eyelid, which I was utterly unable to restrain. This lasted all the time the wound in the gum caused by the extraction of the stump was open, but it ceased as soon as the gum had healed, and has never since returned. A case is recorded by Gaine\* in which a carious tooth of the upper jaw had caused an abscess in the antrum. The right upper lid was paralysed, the pupil dilated, and there was no reaction. The optic nerve was pale, and the eye blind. On extraction of the tooth and puncture of the antrum the paralysis of the lid disappeared, although the eye did not regain sight.

\* Gaine, "Brit. Med. Journ.," Dec. 30th, 1865.

Spasmodic contraction of the masseters is another consequence of dental irritation. A few weeks ago a gentleman, over forty years of age, called upon me and told me that he was much concerned about a spasmodic affection of the jaw from which he was suffering. He was, in fact, afraid of lock-jaw. He felt obliged to keep his mouth open, because it seemed to him that if he once shut it he would not be able to open it again. I did not recollect having read any description of this affection, but it seemed evident that it must depend either upon congestion of the cerebral centre for the movement of the jaw, which Ferrier locates at the lower end of the fissure of Rolando, or on reflex irritation from the mouth itself. The latter seemed to be much the more probable, and on looking into his mouth I saw that the teeth did not seem to be altogether in good order. I accordingly requested him to see a dentist, and, on inspection, the source of irritation was discovered to be a wisdom-tooth, which was just making its way through the gum, but in a somewhat oblique direction, so that its crown was pressed against that of the molar in front of it. On looking up the literature of the subject, I discovered that this affection was pretty fully described by Germain\*, who recognised two

\* Germain, "Gaz. Hebd.," 1863, x. 7.

causes for this form of trismus. The first is when the back molar is decayed, and a gumboil forms at its base, and the other is when the attachment of the masseter extends in front of the angle of the lower jaw, and the wisdom-tooth, in appearing, must break through its muscular and fibrous attachment. Colin states that every year he sees at least one perfectly healthy individual become suddenly affected with spasmodic contraction of the masseters. There is no fever, but the contraction is so strong that only fluid nourishment can be taken. The contraction can be felt by running the finger over the masseter muscle. It gradually disappears in about eight or fourteen days. Little treatment is required except attention to the bowels, and possibly, if the contraction be very severe, an injection of atropia into the muscular substance itself might be of service.

We have already noticed paralysis of the eyelid as a consequence of dental irritation, and we have also discussed the pathology of temporal and occipital headache in relation to caries of the teeth. Sometimes, however, paralysis occurs of a much more extensive character, in consequence of dental irritation, especially in children. Teeth-<sup>ing</sup> is recognised by Romberg and Henoch\* as

\* Colin, "Études Cliniques de Médecine Militaire."

a frequent cause of paralysis appearing in children without any apparent cause. According to Fliess,\* paralysis of this sort occurs more commonly during the period of second dentition, whereas convulsions generally occur during the first. Its onset is sudden. The child is apparently in good health, but at night it sleeps restlessly, and is a little feverish. Next morning the arm, or more rarely the leg, is paralysed. The arm drops ; it is warm but swollen, and of a reddish-blue colour. It is quite immovable, but the child suffers little or no pain. Not unfrequently paralysis is preceded by choreic movements. Sometimes recovery is rapid, but at other times the limb atrophies, and the paralysis may become associated with symptoms indicating more extensive disturbance of the spinal cord and brain, such as difficulty of breathing, asthma, palpitation, distortion of the face, and squint, ending in coma and death.

It is only in very rare instances that we are able to gain any insight into the pathological anatomy of such cases, because they rarely prove fatal, and even when they do so the secondary changes are generally so considerable as to leave one in doubt as to the exact mode of commencement. This renders all the more valuable the case recorded by Fliess,† in which a boy five years old,

\* "Klinische Wahrnehmungen und Beobachtungen."

† Fliess, "Journ. der Kinderkr.," 1849, July and August.

and apparently quite healthy, found his left arm completely paralysed on awaking one morning after a restless night. The arm was red, but the boy suffered no pain, and played about without paying much attention to the arm. The same day he fell from a wagon upon his head, and died in a few hours. Apart from the fracture of the skull, which caused his death, the anatomical appearances which were found were congestion of the spinal cord near the point of origin of the brachial nerves; the meninges were here much reddened and congested; the veins were much fuller than on the corresponding right side. There was no organic change perceptible, either in the spinal cord or in the brachial nerves. On the other hand, the turgescence of the veins extended from the shoulder and neck up to the face, and was very striking in the sub-maxillary region.

This vascular congestion seems to point to vaso-motor disturbance of a somewhat similar kind to that which we have already noticed in connection with occipital headache, or with migraine accompanied by subjective appearances of either form or colour. Chronic movements, as we have said, have been noticed as prodromata of paralysis, and occasionally dental irritation may give rise to chorea alone. This irritation may depend, according to Levick,\* either upon the

\* Levick, "Amer. Journ. of Med. Sciences," Jan., 1862, p. 40.

second dentition, or upon dental caries, and the causal connection between the two is shown by the fact of it disappearing when the tooth pierces the gum, or when the carious teeth are extracted.

According to Russell Reynolds,\* the second dentition is also a cause of epilepsy, and he has observed that those who are affected by it have often suffered from convulsions during the first dentition. A case is recorded by Albrecht† of a boy, aged twelve, who suffered daily for twelve months from general convulsions, which began in the temporal region and extended to the external auditory meatus. There was no decay in this instance, but the teeth were large, and the last molar on the right side had its crown jammed into the ascending ramus of the jaw. As soon as it was extracted the pain ceased, and the convulsions did not return. Another case is given by Mr. Castle‡ of a young man, aged nineteen, who had complained for four years of headache and pain in the eyes, stiff-neck, swelling, and numbness of the right arm. For the latter two years he suffered from general convulsions, which came on every two or three days, ending with vomiting, and often succeeded by partial deafness. All treatment was useless, and setons and blisters to the neck did no good. Nearly all the teeth were

\* Russell Reynolds's "Lancet," July, 1848.

† Albrecht, Casper's "Wochenschr," 1837.

‡ Castle, "Lancet," Jan., 1848.

decayed; nine were extracted, and almost all of them had matter at their roots. A gargle was given, with five grains of iodide of mercury twice a day, and a purgative twice a week. After the extraction of the teeth the fits entirely disappeared.

Affections of the intestinal track depending on dental irritation are of very considerable importance indeed. The diarrhœa which comes on in children during dentition is well known, and is probably of a reflex character.

In adults many a case of dyspepsia is due to defective teeth, partly, it may be, from reflex affection of the nerves, both secretory and motor, of the stomach and intestines, but partly also, without doubt, from the imperfect mastication of the food, which is swallowed without being broken up on account of the pain or inconvenience which the act of mastication causes. In this way two evils are occasioned. First of all, the shortened sojourn of the food in the mouth allows no time for the secretion of saliva. From want of this the starchy constituents of the food are imperfectly digested; and, moreover, deficiency of saliva also lessens the normal stimulus to the secretion of the gastric juice; for alkaline fluids, like saliva, stimulate the secretion from the stomach, and this deficiency of saliva is accordingly followed by a deficiency of the gastric juice. But, secondly, imperfect mastication has a mechanical action in

preventing perfect digestion, for the food, being swallowed in lumps, is not permeated by the digestive fluids, and thus cannot be dissolved in anything like the same period of time that it would otherwise be. The diarrhoea which occurs in children is probably produced through the gastric and intestinal branches of the vagus, and other branches of this nerve may be affected reflexly from the teeth. In a case recorded by Lederer,\* the second left upper incisor was replaced in a young girl by an artificial tooth. Shortly afterwards she became ill, vomited everything, and suffered from convulsions. No remedy succeeded until the tooth was removed and shortened. Immediately all the symptoms from which she had suffered disappeared.

The close connection between the roots of the fifth nerve, and those of the vagus, can be demonstrated anatomically, and it is probably in consequence of this that irritation of the fifth is able to exert such a powerful influence upon the circulation. Some time ago, in a paper which I published in the "British Medical Journal," I mentioned that the cause of death during the extraction of teeth under chloroform was probably the stoppage of the heart's action through the inhibitory fibres of the vagus, associated with a reflex

\* Lederer, "Wein. Med. Presse," vii. 24, 1866.

depression of tone in the blood-vessels. The reason why the extraction of a tooth in a person who is not under the influence of an anæsthetic, is followed by no ill effects, is probably this: that in him the irritation of the fifth nerve produces two distinct actions which counterbalance each other. It may cause reflex stoppage of the heart through the vagus; but at the same time it causes reflex contraction of the vessels through the vaso-motor centre. This contraction of the vessels maintains the pressure in the arterial system during the stoppage of the heart, and thus no harm whatever is done. When an anæsthetic is used, however, one of these pieces of nervous mechanism may be paralyzed by it, while the other is not, and thus the extraction of the tooth may stop the heart without causing contraction of the vessels. The blood-pressure will then sink very rapidly in the arterial system, and fatal syncope may be produced. If, however, the anæsthetic be pushed to a greater extent, so that both parts of the nervous mechanism just mentioned are paralysed, the vessels are not contracted, but neither is the heart stopped. The operation is therefore comparatively free from danger when no anæsthetic has been given, or when the anæsthesia is perfectly complete, the period of danger being that of imperfect anæsthesia.

We have now seen how affections of sensation,

of motion, and of nutrition may all be dependent upon dental irritation, but even the cerebral faculties themselves may also suffer from a similar cause. One or two very interesting cases of this sort are recorded by Dr. Savage in the "Practitioner" for June, 1876. The first of these was that of a farmer, aged twenty-two, with a strong family tendency to insanity. In May, 1875, he suddenly took to riding madly about the country without his coat and waistcoat. From May until November he was exceedingly noisy, destructive, untidy, almost constantly excited, and if for a day or two he was exhausted, he was sullen and more dangerous. In the middle of November he complained of very severe toothache that caused him to be sleepless. He bore this for two or three days, after which the stump was removed. There was suppuration at the root of the fang. From the time that the stump was extracted the patient steadily improved, and by the middle of December was quite well. Another case was that of a woman, aged thirty-four, who had a brother insane, and had herself been intemperate. She was admitted in September, 1875, suffering from acute mania. She was noisy, violent, and obscene. She continued to be so until January 20th, 1876, when she complained of great pain, with swelling, and redness of her right lower maxilla. She had some bad teeth, but did not

complain of toothache. The pain and swelling increased, and at the same time she became quiet and reasonable. She said she could not remember much of her state of excitement. The swelling of her face subsided, and she remained quite well. This case, however, was not so convincing as the first one recorded, because here there was a second possible cause of recovery, as she was pregnant, and said she felt quickening about ten days before her recovery. The recovery, however, was coincident with the pain and swelling of the face, and seemed, rather than the quickening, to be the cause of recovery.

## DISCUSSION.

The PRESIDENT said he thought members of their profession might congratulate themselves on the fact that medical men now paid more attention than formerly to the effects of local irritation. He had met with many cases in which the patient might have been saved much suffering had some of the facts to which Dr. Brunton had called attention been more generally known. He remembered especially the case of a gentleman whose health had been greatly impaired by severe neuralgia, so that when he came to Mr. Woodhouse he was reduced to living on brandy and milk, and was miserably thin and weak. Mr. Woodhouse found that both upper canines were carious, the pulp of one being exposed and inflamed, though the patient had never had any pain in it ; the other was not so bad. He destroyed the pulp of the one and filled the other ; the patient had no pain afterwards, and soon regained his health. He hoped that Dr. Brunton's paper would again draw the attention of medical men to this important subject.

Mr. CHAS. TOMES said he wished in the first place to ask Dr. Brunton a question. He had referred in his paper to some experiments which had been performed by Prof. Schiff, in which he found that irritation of the branch of the fifth nerve supplying the teeth produced a reflex effect on the eye of the same side. Mr. Tomes would be glad if Dr. Brunton could inform him on what animals these experiments were tried, and in what way the impairment of vision was tested. The correctness of these observations was of some practical importance, since division of the inferior dental nerve was a recognised surgical operation which was practised as a last resource in cases of obstinate neuralgia. He had performed the operation a good many times and had never known it to be followed by dimness of vision, but if it should appear that there was some risk of this occurring of course the operation must be abandoned.

Then with regard to the general pathology of migraine. Dr.

Brunton had advocated the view that it was due to spasmodic contraction of the vessels. If this were so, the pain should always be relieved by nitrite of amyl, but this was not invariably the case, even though the nitrite was so administered as to produce extreme vascular relaxation. The inhalation of ether again produced great vascular relaxation, evidenced by flushed face, full bounding pulse, &c., but on one occasion he had distinct evidence of the occurrence of an attack of neuralgia whilst the patient was fully under the influence of ether. This was in the case of a man who suffered from very severe paroxysmal attacks of neuralgia affecting the region of the inferior dental nerve, and always accompanied by a spasmodic twitching of the lip. Mr. Tomes first tried stretching the nerve at the mental foramen, and as this gave no relief he cut down upon it again and removed a portion. During one of these operations, whilst the patient was fully etherized, the peculiar twitching of the lip occurred which indicated a paroxysm of neuralgia.

Lastly, Dr. Brunton had quoted some German authority who asserted that the spasm of the masseter which was not unfrequently set up by the wisdom-teeth during the process of eruption was caused by the tooth tearing through the fibrous attachment of the muscle, and that it was thus due to direct, and not to reflex, irritation. But the tooth if erupted in the usual situation did not approach anywhere near the attachment of the masseter; and if the tooth was displaced outwards the external plate of the jaw was so exceedingly thick and hard that the tooth, on coming into contact with it, was always diverted from its former course. He thought, therefore, that the view usually held, viz., that the spasm was of reflex origin, was more likely to be correct.

Mr. SEWILL thought that the Society was to be congratulated on the fact that it would have in its "Transactions," the best account of the connection of the teeth with nervous disorders which had yet been published. Dr. Brunton had collected from various sources some remarkable cases of serious disorders

of the nervous system resulting from dental irritation ; but he himself had been greatly impressed by the extreme rarity of such cases in practice. He had been for twelve years dental surgeon at a metropolitan hospital ; he had seen during that time not only a large number of patients who had applied to him directly, but had also had a considerable number of patients referred to him by his medical and surgical colleagues, and he had kept careful records of all exceptional cases. Yet amongst all these patients he had not met with a single case of severe nervous disorder which could be said to be directly dependent on disease of the teeth. Some nervous diseases, such as epilepsy, might be aggravated by dental irritation ; but as the direct result of this he had met with nothing more serious than neuralgia and spasm of the masseter. He had not even met with a case of distant neuralgia which could be assigned to this cause ; the pain was, in his cases, always confined to the head and face. He might remark, also, that Dr. Brunton's personal experience was exceptional ; *incipient* caries rarely produced neuralgia ; its occurrence generally indicated the existence of a large cavity. Nor did he think that incipient caries would cause enlargement of a lymphatic gland. If this was present, inflammation of the pulp, alveolar abscess, or periostitis would almost certainly be found. On the other hand, there was no doubt that dental neuralgia might intermit, although the exciting cause was still present ; and also that it could be cured, temporarily at least, by tonics. An interesting case of spasm of the masseter caused by dental irritation had lately been related by the President of the College of Surgeons of Ireland at a meeting of the Surgical Society of Ireland, and would be found reported in the "Medical Press and Circular." It should be remembered that inflammation of the parts about the jaw might cause a stiffness which would closely resemble spasm of the masseter, and, as a matter of fact, inability to open the jaw was more often due to inflammatory changes than to nervous spasm. The remarks he had made respecting the rarity of severe nervous symptoms as the result of dental irritation referred only to adults. In infancy grave nervous disorders

did no doubt occur not unfrequently from this cause ; but dentists did not as a rule see much of this class of cases.

Mr. COLEMAN said he was surprised to hear that Mr. Sewill had never met with cases of nervous derangement which were due to dental irritation. He himself had published several very clear cases in the *Lancet* some years ago, and had seen many since. Quite recently, a little girl was brought to him who had become subject to fits ; he removed some carious teeth, and the patient had no more fits. The late Mr. Holmes Coote had assured him that talipes equinus was more frequently due to nerve irritation set up during teething than to any other cause. He would take that opportunity of thanking Dr. Brunton for his paper, which, if it did not set forth any new facts, certainly gave a more scientific explanation of the pathology of these cases than had yet been attempted.

Mr. GADDES said he had lately met with a case which showed clearly the effect of dental irritation in aggravating nervous disease. A girl, aged 17, came to him at the National Dental Hospital ; she had been subject to epileptic fits for two years, and when she came to him was having on an average two a week. There was no family history of epilepsy. Some of the bicuspid teeth were much broken down by caries, and had decomposing pulps. Some time previously she had broken her upper central incisors in one of the fits, and the pulps of these teeth also were exposed and suppurating. As the girl had some pretensions to good looks, which would have been materially affected by the extraction of the teeth, and the wearing of a plate by an epileptic was dangerous, he did not remove them, but cleared out and filled the pulp canals. The result of this treatment was that during the next three months the girl had but one fit, showing an evident connection between the state of the mouth and the fits.

The PRESIDENT here called attention to the fact that the hour at which the meeting usually terminated had almost arrived. He thought, however, that considering the interest

and importance attached to the subject under discussion, the members present would probably wish to prolong the debate for another half-hour.

A motion to this effect having been proposed and seconded by Mr. Oakley Coles and Dr. Walker, was put to the meeting and carried unanimously.

Mr. OAKLEY COLES said he thought every dentist must have met with cases like those referred to by Mr. Coleman and Mr. Gaddes. Not long since a girl was brought to him who had become subject to epileptic fits; he extracted two very carious teeth and she had had no fit since. He was much surprised to hear Dr. Brunton's report of the result of Prof. Schiff's experiments on the inferior dental nerve. He himself had never known any impairment of vision follow its division. He remembered a case in which the late Sir William Fergusson divided this nerve fourteen times on the same patient; after each operation the man obtained relief from pain for some weeks or even a few months, and he certainly never made any complaint of dimness of sight.

Dr. WALKER said he had seen many instances of the serious effects of dental irritation on the nervous system of young children, especially when they were weakly or had a scorbutic tendency. He would especially instance one family, all the surviving members of which had been for some years past constantly under his observation. The first three children died during the period of the first dentition: after this orders were given that the others should be taken to the dentist as soon as they were 6 months old, and afterwards whenever they suffered any little indisposition. Since these regulations had been carried out seven children had been successfully reared. The children were brought to him directly any symptoms of irritation showed themselves; he never lanced the gums, but scarified them freely with a sharp point. On several occasions the good effects of this treatment had been most marked. For example, the father going home to his

country-seat on a Saturday noticed that one of the children squinted; he was sent to Dr. Walker on Monday, the squint still persisting, but next day it had entirely disappeared. Another child lost the use of one leg for three days; the gums were scarified, and he was well again directly.

About nine years ago a child was brought to him who had been for some time subject to epileptic fits. Her general health was very bad and her teeth much decayed. She remained under treatment for fifteen months, and as the mouth was got into better order the fits gradually disappeared, and she had since turned out a very clever girl.

A MEMBER said he had met with a very similar case. A boy, aged 9, was brought to him by his mother, who stated that he had suffered for ten months past from pain in the face and frequent fits. On examining the patient's mouth he found that the second dentition was backward; a lower molar was also decayed, though not much, still the boy said he had suffered occasional pain in it. He filled this tooth and removed the deciduous left lower lateral and canine. A fortnight afterwards the patient returned much improved in health, and from that time he had no more fits.

Mr. F. CANTON said he should like to ask Dr. Brunton whether he thought that paralysis of the arm or leg could occur in an adult as the result of dental irritation? He had met with a case in which pain in a lower molar had been accompanied by spasm of the muscles of the arm and leg, followed by partial paralysis. As the patient was an anæmic young lady, and the effects seemed disproportionate to the cause, he looked upon the affection as being due to hysteria. At the same time he took care to impress upon the patient the idea that the tooth was the cause, and that its extraction would be followed by the complete disappearance of the paralysis. This did actually come to pass, but he did not feel at all sure as to the mode in which the cure was effected.

Mr. J. S. TURNER said his own experience enabled him to

answer Mr. Canton's question in the affirmative. About two years ago a gentleman, aged 28, was brought to him from the country. The patient came into his consulting-room, held up on either side by his father and brother, being unable to walk, and sometimes even to stand, without this assistance; he had also severe trismus. The cause of all this was a lower wisdom-tooth which had grown horizontally outward, perforating the strong outer plate of the maxilla, so that the crown was imbedded in the substance of the masseter. The patient was a stout, healthy man, of somewhat nervous temperament, but certainly not inclined to hysteria. The tooth was removed with considerable difficulty, and the patient made a speedy and complete recovery.

The following case was also interesting from the difficulty of the diagnosis, the usual order of things being reversed. A lady consulted him on account of periodical attacks of most intense left hemicrania; any great excitement would bring on an attack—as for instance, when her husband came home from sea—and whilst the pain lasted she was obliged to shut herself up in a dark room and was unable to see anybody or do anything. She had a most splendid set of teeth, and had never suffered the slightest pain in any of them, but the wisdom-teeth were only partially erupted, and as on careful inquiry the pain appeared to be ultimately referred to the upper dental region, Mr. Turner suspected that the left upper wisdom-tooth must be the source of irritation. He, therefore, removed it and found that it was carious on the buccal surface, the disease having been hidden by the gum. From that day the patient had no more neuralgia.

Mr. DENNANT said that had it been necessary he could have confirmed from his own experience nearly all that Dr. Brunton had said respecting the effects of dental irritation on the nervous system, but as so much had been said on this subject, he would relate a case which would warn members not to confine their attention to a search for decayed teeth as the cause of neuralgia of the head and face since irritation of other cranial nerves might by reflex action produce very similar results.

A lady, of middle age, consulted him on account of severe neuralgia of the head and face, which she thought might be due to a diseased tooth ; he examined and percussed the teeth, but could find nothing. A paroxysm of pain came on during the interview, and the patient at once asked if there were any flowers in the room, adding that the smell of flowers always had this effect. There were some roses on the table at the time. Any irritation of the olfactory nerve would bring on the pain ; even the smell of smoke. Mr. Dennant recommended mountain air, and she then said that she had suffered in a somewhat similar manner fifteen years before, that the same advice was then given to her, and that she had derived great benefit from the change.

Mr. S. J. HUTCHINSON said he should like to ask Dr. Brunton three questions :—(1) Had he any experience of the value of tincture of Hamamelis in the local treatment of facial neuralgia ? (2) He had understood him to say that the inhalation of chloroform in small quantity was apt to exert a depressing effect on the action of the heart, but that when given in larger amount this effect was counterbalanced by contraction of the small arteries : how did the action of nitrous oxide differ from that of chloroform in these respects ? (3) He had referred to the fact that purgatives would cure neuralgia : could he give any explanation of the way in which this was effected ?

The PRESIDENT having called upon the author of the paper for his reply,

Dr. BRUNTON said that as the time at his disposal was very short he could only deal briefly with the most important of the questions which had been put to him—those specially requiring an answer.

He could not then reply to Mr. Tomes's first question, for he had been unable to obtain a copy of the original paper by Prof. Schiff, but he hoped to be able to get one in a few days, and would then give Mr. Tomes the information he required. Mr.

Tomes doubted his explanation of the pain in migraine, because nitrite of amyl did not relieve it, although it produced relaxation of the vessels. But the fact was that the nitrite did not uniformly dilate; it could not dilate a vessel which was contracted by the irritation of a vaso-motor nerve. Hence, although it produced great *general* vascular relaxation, it might not be able to suspend the reflex action of the vaso-motor nerves, and the *local* contraction due to this cause would persist. The same thing probably occurred during the administration of ether, but this he could not positively assert.

He would admit the justice of some of Mr. Sewill's criticisms, and would make some verbal alterations in his paper before it was printed.

In answer to Mr. Canton, he would say that dental irritation might certainly cause paralysis in an adult, as well as in a child. The brain centre which presided over the movements of the hand, and that which governed the mouth, were so closely connected that excessive stimulation of one centre might easily derange the functions of the other.

With regard to Mr. Hutchinson's questions. He had never used the tincture of Hamamelis Virginica for dental purposes; it had been recommended to him as a remedy for the irritation of mosquito bites, and he tried it, but with very unsatisfactory results. As to the action of chloroform on the heart. The nerve from the tooth would act upon the vagus centre and upon the vaso-motor centre in the brain. The vagus centre being irritated, would tend to weaken, or even to stop, the heart's action; but the vaso-motor centre being equally irritated, would cause contraction of the arterioles, and thus no fall of blood-pressure would occur. But when chloroform was administered, its first effect (*i.e.*, when given in small quantity) was to paralyze the vaso-motor centre; the action of the vagus being thus left unopposed, cessation of the heart's action might occur without any simultaneous contraction of the arterioles, there would then be an immediate rapid fall of blood-pressure, and fatal syncope might result. Nitrous oxide was opposed to chloroform in that it, or the venous condition of blood which it

induced, acted as a strong stimulus to the vaso-motor centre, and thus the danger from syncope was reduced to a minimum. Mr. Hutchinson's third question was one which it would be impossible to answer briefly, since it opened up a very complex and difficult subject, and he would not therefore attempt it.

On the motion of the President, a hearty vote of thanks was given to Dr. Brunton and to the contributors of the casual communications.

The meeting then terminated.

---

## ORDINARY MONTHLY MEETING.

*April 5th, 1880.*

ALFRED WOODHOUSE, ESQ., PRESIDENT, IN THE CHAIR.

---

THE Minutes of the previous Meeting having been read and confirmed,

The following gentlemen signed the Obligation Book, and were formally admitted to Membership by the President, viz. :—

Messrs. MARTIN HENRY,  
„ WILLIAM MAGGS,  
„ A. BAXTER VISICK,  
„ W. F. THOMPSON,  
„ W. ST. GEORGE ELLIOTT,  
„ GEORGE PEDLEY.

The following gentlemen were balloted for, and elected members of the Society, viz. :—

HUGH WILLIAM DEWES, L.D.S. England., 10, Cavendish Place, W., and

LAWRENCE READ, L.D.S. England, 18, Hanover Street, Hanover Square, W., Resident Members.

GEORGE JOSEPH HUGO, 15, Allez Street, St. Peter's Port, Guernsey, and

MAURICE HUGO, 36, Belmont Road, St. Heliers, Jersey—  
Non-resident Members.

Mr. HENRY SEWILL read the following Casual Communication :—

Mr. PRESIDENT, having your permission to bring forward the communication which I am about to make, I need not

apologize for what under ordinary circumstances might be a breach of order, namely, the reference which I must necessarily make to Dr. Brunton's paper, read at our last meeting, and to the discussion upon it. It will be recollected that in the discussion I stated, as a mere matter of fact, that I had not, either during twelve years of hospital experience or elsewhere, met with a case of epilepsy due to diseased teeth ; and I said that I believed such cases to be extremely rare. I did not say, nor did I mean to imply, that the teeth could not possibly cause epilepsy ; in the present state of our knowledge such a statement could not be supported by any adequate reasons. If the inflammation following the prick of a needle at a part so remote from the nervous centres as the hand or foot may excite the spasms of tetanus, there need be no difficulty in believing that the inflammation of nerve fibrils within a tooth may occasionally give rise to the convulsions of epilepsy. And especially can we admit this when we recollect that in the case of the teeth it is a cranial nerve whose branches are directly the seat of irritation.

I did not by arguments support my statement with regard to the extreme rarity of epilepsy due to diseased teeth, for I imagined that this fact would be admitted, but I might have pointed out that did the teeth act as excitants of epilepsy on any but rare occasions, epilepsy would certainly be a much more common disease than we now find it. The number of children, especially among the poor, who go through childhood and youth suffering almost incessantly from inflammation of their dental nerves must be reckoned by thousands, and if, as a consequence of these teeth diseases, epilepsy followed in even a small proportion of cases, it would be, if not as common as measles, certainly much more frequently met with than at present.

What led me to recur to this subject was the fact that shortly after our last meeting, in conversation with several of my friends, physicians specially learned in diseases of the nervous system, I found a remarkable unanimity of opinion on this point. Several of these gentlemen have been kind enough to

give me their views in a few briefly-written sentences, and these I will now read to the society.

Dr. GOWERS, who has just delivered the Gulstonian Lectures on Epilepsy, before the Royal College of Physicians, in which he has specially and exhaustively discussed the etiology and causation of this disease, writes as follows :—

“I have never met with a case of epilepsy in which there was any reason to attribute the fits to the irritation of decayed teeth. I think that the facts which have come under my notice justify the assertion that, if this cause is operative, its ratio to other causes is less than 1 per 1000.”

It will be observed that Dr. Gowers says, “its ratio to other *causes* is less than one per thousand,” so that I take it we might search the country through without discovering a single case.

Dr. SIEVEKING, who was for years physician to the Hospital for Epileptics, and is well known as one of the highest practical authorities on epilepsy, says :—

“In reply to your question as to the connection between epilepsy and diseased teeth, I should be disposed to affirm that, apart from the convulsions due to dentition in early life, the teeth very rarely afford an exciting cause for epilepsy. I do not at the present moment call to mind a single case in my own experience where such a connection was traced. I have had many cases where some form of indigestion played this part, and it is not impossible that in some of them imperfect mastication was an efficient cause of the irritation propagated to the brain, there inducing the changes that lead up to the epileptic paroxysm, but this does not come within your category of *diseased teeth*.”

Dr. HUGHLINGS JACKSON's name needs no comment to enhance the value of any deliberate statement which he may make. He says :—

“I do not think that anything wrong with the teeth is a cause of epilepsy ; nor have I ever met with evidence to show that it is an exciting cause.”

Dr. FERRIER, whose name and works are well known to all here, writes as follows :—

"MY DEAR SEWILL,—I had not altogether forgotten your query as to the relation, if any, between dental irritation and epilepsy. I cannot, however, among the numerous cases of epilepsy which I have seen, call to mind one in which the circumstances were such as to suggest any such connection. Cases are, however, on record in which peripheral irritation seems to have been at least the exciting cause of epilepsy, which has ceased with the removal of the irritation. I question, however, whether this would be sufficient to induce epilepsy in any case without the previous existence of such an irritability of nervous tissue as might manifest itself at any time as an attack of ideopathic epilepsy, so-called.

"In cases of epilepsy in connection with peripheral irritation, the fit is usually preceded by an aura starting from the seat of irritation. If dental irritation was at the bottom of an attack of epilepsy I think we should find some such evidence in a dental aura. I have never met with such a case. Such a thing is, however, highly possible, and I am only giving my own experience when I say it is unknown to me.

"In attempting to solve the question raised, I should lay stress mainly on the existence of a dental aura, in proof of a relationship between dental irritation and epilepsy, and not on the mere *existence* of dental irritation, which I suppose occurs equally among epileptics and non-epileptics.

"Yours, very sincerely,

"DAVID FERRIER."

Dr. BUZZARD, another high authority on this subject says :—

"I have in no case been able to satisfy myself that epilepsy was caused by disease of the teeth. In the case which I send you herewith there appears to be evidence of a rather close connection between the process of second dentition and the occurrence of epilepsy. If this comes within the scope of your discussion you are very welcome to read it, or to refer to it."

*“A case of Epilepsy and Facial Neuralgia coinciding with the period of second dentition. BY THOMAS BUZZARD, M.D.*

“CHARLES —, at 11, was brought to the National Hospital for the Paralysed and Epileptic, on February 26, 1873, on account of epileptic fits.

“He was a delicate-looking lad with a well-shaped head. He had been weakly and backward in childhood, not walking till he was twenty-two months old. The eruption of the temporary teeth was much delayed.

“In May, 1871 (when nine years old), he fell one morning from his chair into the fender. At this time he was cutting a lateral incisor. A couple of months later he was found one day lying in his vomit in the garden quite insensible, the limbs slightly struggling. Two months after this he came home from school, and whilst standing at a table a spasm seized his right arm and he upset the teapot, then said, ‘Eddie’s knocked my arm!’ turned up his eyes and turned round. He struggled much, and his face became blue. The fit lasted nearly an hour and a half; during the latter part of it he screamed out expressions like ‘Let me go, let me go!’ After this he took bromide for six months. During this time he had three or four fits, the first of which were bad, but the later ones slighter. The bromide, it was thought, had weakened him.

“At ten years of age he cut the two lateral incisors of the upper jaw. During this process he suffered twice a week or so from what is described as ‘fearful’ neuralgia of the two upper divisions of the fifth nerve. This lasted six weeks, and then ceased till the middle of December last, since which he has had more or less neuralgia every day, sometimes for three hours together. Both sides of the face are affected, and the pain appears to start from the upper temporary canines which remain unshed. The right one is tender on hard pressure.

“His father is a strong, healthy man. His mother suffered much from tic between 16 and 46 years of age. Her father and three of her brothers have also had tic.

"The boy had a fit whilst being examined. He bowed his head down. The pupils dilated largely, and then contracted very much. There was then convergent strabismus and tonic spasm of the extremities followed by clonic convulsions. It appeared that for the last week the boy had suffered about four attacks like these daily.

"Dr. Buzzard advised removal of the right canine tooth, and ordered cod-liver oil, with quinine and iron.

"*March 12.*—The neuralgia has much diminished since the tooth was drawn, and the boy looks better. He has had two severe fits, besides three or four attacks daily of co-ordinated convulsions, in which he tries to bite his fingers, and complains of 'something turning round at the top of the head.' He had an attack of neuralgia of the upper divisions of the fifth on the right side, but it only lasted a few minutes. The treatment was continued. The neuralgia almost disappeared, but he continued to have a fit daily, usually in the evening. He greatly improved in appearance.

"In May it is noted that he had in the preceding month three bad epileptic fits and many slighter ones. In June the fits are said to be more frequent, but he had nearly lost the shaking of the right arm by which they had been usually preceded.

"The treatment adopted included bromide of ammonium, sumbul, valerianate of ammonia, besides cod-liver oil pretty constantly. In December it is noted that he has had no epileptic fit since July, but facial neuralgia once a week.

"*January 21, 1874.*—Has had a slight epileptic fit. He had cut another molar a week before it occurred. He has now nineteen teeth, of which there are four permanent molars, and eight permanent incisors.

"*March 4.*—Has had numerous fits till a tooth (? bicuspid) came through; since then they have much diminished. He continued treatment during the year.

"In the following May, 1875, he cut three teeth. His health had now remarkably improved. The fits were very slight. He occasionally had an aura passing up the right foot, but not ending in a fit.

"*July 18, 1875.*—It is two years since he had a bad fit, and nine weeks since he had a slight one, and in this he scarcely lost himself. The canine teeth project considerably, but have not descended to the level of the others. He never has neuralgia now. He was discharged.

"In March, 1880, nearly five years later, he was brought to the hospital again. It seemed that he remained quite well, and had no return of fits till fifteen months ago, since which time he has had a few, but not severe ones. About four months since he complained of pain at the back of the jaw, and it was found that he was cutting his lower wisdom-teeth.

"*Remarks by Dr. Buzzard.*—It is of course constantly happening that the occurrence of epileptic fits coincides, in point of time, with the process of teething; but, except in this case, I do not think that I ever met with any evidence that the connection between the two circumstances was more than that of association. In the case just related, typical neuralgia of a very severe kind occurred at the period of second dentition, and was unmistakably influenced by the removal of a tooth. At the same time, with the neuralgia, fits occurred which were usually of a hystero-epileptic character, though some must be described as distinctly epileptic. The fits and the neuralgia often appeared to replace each other, and thus suggested that they might be immediately dependent upon a common source of irritation.

"It is worthy of note that the fits were diminished in frequency after the eruption of a tooth, and entirely ceased when second dentition was accomplished, and that the lad remained free of them, as well as of neuralgia, for three years and a half, from about 14 to 17½ years of age. During this period he took no medicine whatever. A recurrence of fits has since taken place, commencing not long before the cutting of wisdom-teeth.

"It appears to me, that in this case there is a very considerable probability that the process of dentition, in a patient with strong neurotic inheritance, has determined the occurrence of epileptic and hystero-epileptic seizures."

Mr. SEWILL continued :—I think I have been accidentally enabled to place on record in our *Transactions* a deliberate judgment with regard to the relation of the teeth to the causation of epilepsy, as weighty as it would be possible to produce ; and this must be my excuse for troubling you with these remarks. If our opinion be asked in any case as to whether epileptic convulsions may be due to diseased teeth, I think the answer must necessarily be that it is extremely improbable, though possible, that the teeth are the cause of the malady. And we may at least add, that seeing that the possibility does exist, it would be well, should there be no contra-indication, to remove all dental irritation, in the faint hope that with it might also be removed the exciting cause of the epilepsy.

In endeavouring to establish a diagnosis it would also be well to bear in mind the fact which Dr. Ferrier points out, that fits due to the teeth would probably be preceded by an aura felt in their neighbourhood.

Dr. WALKER said he thought that thanks were due to Mr. Sewill for having called the attention of these eminent members of the medical profession to the fact that dental irritation might produce epilepsy, as shown by the case recorded by him in the Transactions of the "Odontological Society" of last month. He felt convinced that dental irritation was an occasional cause of epilepsy, and he could only explain the statements to the contrary, which had been read by Mr. Sewill, by supposing that the attention of these physicians had never been specially directed to the subject ; he was glad that this had now been done, and he thought that if the same question were to be again put to them six or seven years hence, their verdict would probably be different from that which had just been quoted.

Mr. COLEMAN said he also had no doubt that dental irritation was an occasional, and not very uncommon, cause of epilepsy. As medical authorities had been quoted on one side, he would refer on the other to the late Dr. Baly, who published in the

Abernethian *Transactions* the case of a prisoner at Millbank, who suffered from fits which were evidently due to nervous irritation set up by a tooth. He did not quite understand what Dr. Ferrier meant by a "dental aura;" the expression was not quite clear.

Mr. OAKLEY COLES said that at the last meeting he mentioned the case of an epileptic girl whose fits ceased after the extraction of two carious teeth. This patient was sent to him by Dr. Ferrier, with the suggestion that possibly attention to the state of the teeth might prevent the fits. Yet Dr. Ferrier stated that he had never met with a case in which epilepsy was directly caused by dental irritation. If the bad teeth were not the cause of the epilepsy in this case, he could only say that he was under a misconception as to what was meant by the term, "direct cause."

Mr. SEWILL, in reply, said that Dr. Ferrier had in his letter readily admitted the possibility of epilepsy being occasionally due to the irritation of diseased teeth, though he said he had never happened to meet with a case in which the connection could be clearly established. The notes he had read were not formal documents, but were written in a friendly conversational style; the writers had stated their opinions as briefly as possible, without at all entering on the grounds upon which they had been formed. He thought, however, that it might be taken for granted that men of their acknowledged position would not deliberately give an opinion on a subject to which they had paid no attention; and that they would have been quite able to substantiate them by good and sufficient reasons had they been called upon to do so. By the term "dental aura," he understood an aura shooting from, or apparently originating in, the dental nerve.

Mr. OAKLEY COLES then presented to the Society a set of models illustrating every variety of deformity of the upper jaw, including those due to the effects of syphilitic disease.

ADJOURNED DISCUSSION ON MR. OAKLEY COLES' paper on  
"DEFORMITIES OF THE UPPER JAW."

The PRESIDENT said :—I have made an abstract of the paper for the purpose of introducing the subject, but as I feel sure you have all read the original carefully I don't think I need read it. Mr. Coles first of all described his mode of measuring the jaw by drawing a triangle formed by a line drawn from the centre of the distal surfaces of the second molars across the palate, and by lines drawn from the extremities of this base to the space between the two central incisors ; another line was then drawn across the mouth from one second bicuspid to the other. Each of these lines was accurately measured ; and these measurements were first of all used to define the sizes of the jaws of different nationalities, and afterwards to define the sizes of deformed jaws. He defined them so accurately that he thought it was desirable to give them new names, according to their sizes and peculiarities of form ; and he gave them the seven names which I have no doubt you remember. At the conclusion of his paper he also gave you his idea as to what were the causes of these irregularities in the form of the jaws. Dr. Walker having proposed the adjournment of the discussion, I shall call upon him now to open the debate.

Dr. WALKER said :—Mr. President, my remarks will be few, hoping that others who take a deep interest in this subject will give us their views upon it. Our best thanks as a Society are due to Mr. Oakley Coles for the production of his paper, read on the evening of February 2nd of this year. This very original paper is interesting to us from three points of view. Mr. Oakley Coles has endeavoured to define in clear lines a fully and well-developed maxilla, and also the various types between the well-developed and the ill-proportioned, giving to each subdivision a distinctive name. Secondly, he has endeavoured to show how the ill-proportioned maxilla have received the impulse of development. Thirdly, his deductions all point to the care which parents and surgeons should take in youth to prevent the growth of a maxilla with a tendency to prognathism. It is

a paper which you will excuse my referring to rather largely, as, if we may judge of other men's brains by our own, it is impossible, after hearing a paper of this sort once read, to carry all the points accurately in our mind. I, therefore, with your permission, will refer to a few paragraphs and make observations upon them. I will leave to others the triangles and the character of the measurements, and will take up the paper at p. 128.

Mr. COLES there says :—"My first assertion is this, that the deformity known as *intermaxillary prognathism* is the result of a force operating on the intermaxillary bone, such force originating in the body of the sphenoid, and being transmitted by the intervening nasal septum. (I may at once say that when speaking of *force* I mean a direction of growth in a given line of such energy as to overcome the resistance offered to it by surrounding structures.)" My comment on this passage is in the nature of an inquiry—What "force" may we understand Mr. Oakley Coles to refer to? Does he mean that there is a growth of brain substance behind the sphenoid bone, which forces the sphenoid bone bodily forward? or does he mean hypertrophy of the sphenoid bone itself, producing displacement of all the parts in front of it? or does he mean that the articulation of the sphenoid bone is entirely different in character in such skulls as he alludes to? Then at p. 129 Mr. Coles goes on to say :—"The foregoing assertion is based upon the interpretation of the following observed facts :—First, the true case of intermaxillary prognathism will have a long thin nose; secondly, this long thin nose is not observable during the first dentition, nor is there prognathism, excepting to a very slight degree indeed. Hence we may conclude that the long thin nose and prognathous jaw are capable of intensification by growth and development during early life." My question on this extract is this—How many cases can Mr. Coles refer us to in which he has clearly traced this process of growth from youth upwards? "Thirdly, it has been shown that the measurement from the interbicuspid line to the incisive angle is greater in the

prognathous than in the normal jaw : hence it follows that the change from the normal arch occurs at a point anterior to the second bicuspids, whilst the second bicuspids are known to correspond with the position of the second molars of the milk dentition. Thus it is shown that the prognathism is not of the whole jaw carried forward on a horizontal plane, but is really intermaxillary or alveolo-sub-nasal in its character. Fourthly, it is a simple logical sequence of the process that produces intermaxillary prognathism, carried a step further during embryonic life that produces double hare-lip and fissured alveolus." Evidently there are two points referred to here : first of all, that this condition can be watched during the first dentition, though to me this sounds a little contradictory after what we were told just before about prognathism not being observable at this period. And secondly, that Mr. Coles can give us the history of perhaps several cases.

To continue my quotation,—“Arguing back from these cases of double hare-lip to premaxillary prognathism, we can come to no other conclusion than that the duration and extent of the force operating upon the premaxillary bone, determines the nature and extent of the deformity that will be produced.” Here was another reference to the mysterious “force” which I have not been able to identify. Then, at p. 131, there is another passage which I will read :—“From collateral evidence we know that many cases of prognathism are associated with such central lesions as will manifest themselves in the form of idiocy or imbecility ; and, further, that the general configuration of the face is ape-like, from its diminishing facial angle and retreating chin ; and we also know that in the apes, the intermaxillary suture is not ossified till late in life.” We wish to ask Mr. Oakley Coles to what “central lesions” he alludes in this paragraph? Another passage, at p. 132, reads as follows :—

“It will, therefore, scarcely be straining the argument unduly if we assume that as man by deteriorations returns to the type of the higher apes, so, by the like process, he will in his

method of development be subjected to similar conditions of growth and ossification. I do not, of course, wish it to be understood that all who have intermaxillary prognathism must of necessity be either idiots or imbeciles; but I desire very distinctly to assert that such a deformity occurring amongst the highly civilized is a distinct mark of deterioration of stock; whilst it is differentiated from the normal prognathism of the Hottentots by the diminished interbicuspid measurement of the highly-bred skull."

It appears to me that one of the principal points which Mr. Coles wishes to prove is, that we may be able by the shape of the jaw to determine the future of a patient. Evidently he does not mean to say that all those with prognathism must be idiots, but that many of those that are idiots have prognathism. Mr. Oakley Coles, then, wishes us to understand that from his careful observation of the large number of children with whom he has been brought in contact, he can, by the shape of the jaw, at any rate now and then, perceive that there is a probability of idiocy lying dormant in perhaps some of his best patients. If that is his idea, the practical bearing of the paper appears to me to tend to this question:—What treatment would he advise the parent to adopt? Having thought this over, and through the kindness of Professor Flower here are specimens, or models, of the jaws of men of different nationalities; and those who are continually in the open air, those who are constantly following either warlike pursuits, or obtaining their food by hunting or fishing, living chiefly outside houses, have jaws which are fully and very largely developed: the jaws being in most instances by far a larger circle than the aggregate diameters of the teeth they contain: hence we obtain a jaw with interstitial spaces. If you look at these models and recollect the habits of the various nations to which they belong, you will find that the more they are confined in habitations of any kind or character, the less developed do we find the jaw; until we come down to an ordinary English model.

To bring back the development of the maxillæ to the type

of the early Saxon, what means can be adopted? First cast away the fashionable dressing of children, allow them free use of all their muscular development by keeping them in the fresh air of heaven, and granting them such diet as will develop bone as well as muscle—such as breads with bran—unwhitened breads, vegetables, less meat, abundance of milk, pure spring water.

Perhaps Mr. Cole may inform us if he has found benefit in any case by such like treatment.

The SECRETARY then read a communication from Mr. Balkwill, of Plymouth.

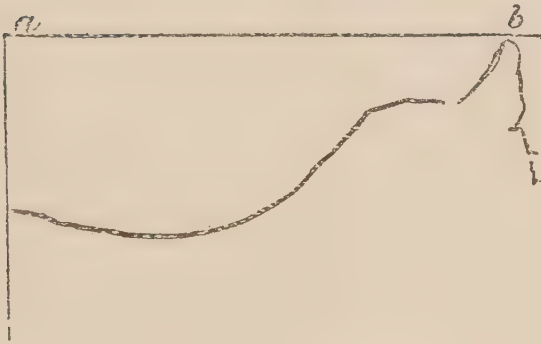
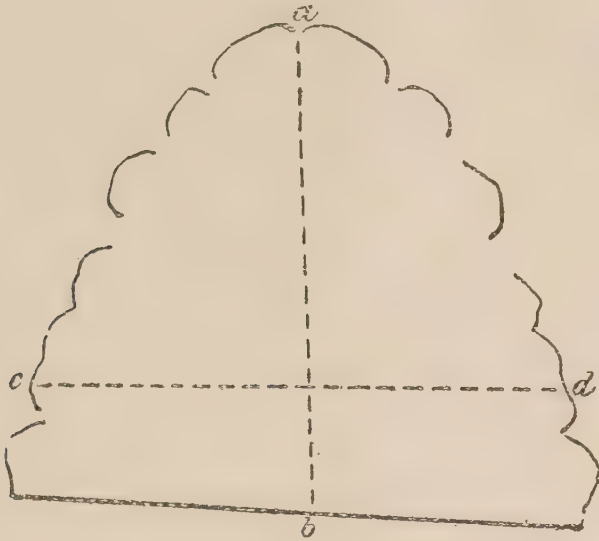
Having lately, at the instance of Dr. Hack Tuke, made observations of about fifty models of upper jaws in order to see if any connection could be traced between the contracted or V-shaped arch and mental deficiency, the best method of making diagrammatic representations of these for reference and comparison was a question for consideration which induces me to make a few remarks upon Mr. Oakley Cole's valuable paper of last month on the subject.

In the first place, the impression is strong that the varieties of form are too great to be properly represented by so simple a diagram as that given by Mr. Coles. The underlying forces and conditions seem too complex and numerous to be so represented, and I should have no hesitation in saying that such a classification must lead to many erroneous generalisations.

We want to see at a glance the angle at which the cutting edges of the centrals meet; the general arch of the teeth, and whether the alveolar margins are full or spare, &c. One point to which attention should be paid is the symmetry of the curve of the arch of the palate, as taken in vertical section. This is frequently askew, and I fancy I can sometimes detect a corresponding mental obliquity; at any rate, this is a point worth noticing.

An objection to using the alveolar border as a fixed level from which to measure the depth of the palate lies in the fact that after thirty an exceedingly variable amount of absorption

takes place even where the teeth are not removed ; and where they are gone much more so, as every Dentist is practically aware.



9. Fig. 1. Outline of upper jaw made by outlining model on the paper.

Fig. 2. Section through fig. 1 *a b*. The line *a b* fig. 2 is the line of the tops of the upper teeth.

Fig. 3. Section through fig. 1 *c d*.

The true fixed level seems to be the plane of the occlusion of the natural teeth.

The foregoing considerations have led me to use the following method of representing any model for future comparison or reference :—

Take a little softened Godiva modelling composition and fill up the palatal part of the model full to the tops of the teeth and press it down with a flat surface until this rests upon the points of the teeth, when cold remove and make a vertical longitudinal section, this can then be placed upon paper and traced, it will give a longitudinal section of the cavity of the palate with the level of the cusps of the upper teeth, from which the depth at any time can be accurately measured. Another section across the first molars or any desired part is then taken with Godiva and traced in the same manner.

The general character of the arch is taken by inserting the model itself upon paper and marking round the outer cusps and cutting edges of the teeth, as the general type of the arch of the teeth is best indicated in the cutting edges of the front teeth, and the points of the external cusps of the masticating teeth. The preceding diagram will illustrate what is meant

The model of a *Macroid* upper jaw sent is that of medium sized country clergyman with no other marked peculiarity about him.

F. H. BALKWILL,

3, Princes Square, Plymouth.

Mr. HENRY SEWILL said that he also should be glad to hear some further explanation from Mr. Coles respecting the points to which Dr. Walker had called attention. But before criticising that part of the paper, he felt bound to enter a strong protest against the barbarous words which Mr. Coles had coined for the purpose of distinguishing his different classes. He did not pretend to be a great classical scholar, and therefore the remarks he was about to make were made not so much in a spirit of criticism as of humble inquiry. Mr. Coles's first subdivisions were the *macroid* and *microid*; these words

were derived from the Greek *μακρὸς*, big, and *μικρὸς*, small, with the addition of the word *εἶδος*, or *οἶδος*, meaning like. There were, no doubt, already in use a number of words ending in "oid," which were compounded of the adjective *εἶδος*, with a substantive, and meaning something like the substantive ; thus, one might very properly speak of a tumour as encephaloid—brain-like, or of a bone as sphenoid—wedge-like, but to speak of a big-like jaw or a small-like jaw was ridiculous, the jaws must be either big or little. As to the terms dolichoid and brachoid, Mr. Coles stated that he had borrowed them from cranial morphology ; but the same objection applied to these as to the other names, and, as a fact, you would not find in cranial morphology any such terms as dolichoid skull or brachoid skull ; scientific people did not speak of the *similitude of a long* skull, or the *similitude of a short* skull, but they spoke of dolichocephalic or brachocephalic races. Intermaxillary prognathism was a hybrid phrase, the meaning of which would puzzle anyone to find out if they had only the derivation of the words to guide them, literally translated it would mean "between-the-jaw before-the-jaw-ism." The test of the value of a scientific term was that it should express the same meaning to scientific men of every nationality. But it might be said that the words had been anglicized, and had a recognised meaning apart from their strict etymological derivation. The term prognathous certainly had a recognised meaning, but it was not the meaning which Mr. Coles wished to attach to it. In certain of the lower races of mankind the jaws as a whole were prominent, the prominence being due in part to the massive form and really increased size of the jaws, but being for the most part rather apparent than real, owing to the smallness of the forehead in these races, in consequence of the small development of the brain. This was what was meant by prognathism, but he doubted whether anybody could tell what intermaxillary prognathism might mean.

"Intermaxillary upognathism" was another extraordinary compound of Latin and Greek. In the first place, *ὑπο* was always written with an aspirate, and therefore he should prefer

to call it "hypo;" and, in the second, it always meant *under*, in the sense of *beneath*, and never in the sense of *deficient* or *wanting*. Assuming, therefore, that intermaxillary upognathism was translatable, it could not mean what Mr. Coles wanted it to mean.

The only words, out of the number which Mr. Coles had coined, which could be said to possess a clear meaning were lambdoid and alphoid; he could find no fault with them, but he could not see that the term lambdoid maxilla was any improvement on the old name V-shaped jaw.

He was not going to discuss Mr. Coles's wonderful triangle, nor to examine critically his base line; he would not attempt to follow him in this trigonometrical survey of the human palate. The technical character of the paper made it a difficult one to grasp, and he had not quite mastered all that Mr. Coles had stated towards the end of his paper. He would only call attention specially to the following passage:—"My first assertion is this, that the deformity known as intermaxillary prognathism is the result of a force operating on the intermaxillary bone, such force originating in the body of the sphenoid, and being transmitted by the intervening nasal system. I may at once say that when speaking of force, I mean a direction of growth in a given line, of such energy as to overcome the resistance offered to it by surrounding structures." It was well known that the ancients ascribed wonderful properties to the pituitary body which was situated on the body of the sphenoid bone, but he had never before heard that any force resided in the body of the sphenoid bone itself. If they would accept, on the authority of Mr. Coles, the statement that the force in the body of the sphenoid bone was capable of controlling and governing the growth of the premaxillary bone, there would be no difficulty in receiving and agreeing with all the other conclusions which Mr. Coles had set forth. This one scientific fact was sufficient by itself to establish the reputation of Mr. Coles, and to shed a reflected halo on all the members of the Odontological Society.

Dr. COBBOLD.—Sir, there are very few points of connection

between the study of dental science and of mental science ; but I think the formation and the shape of the palate and the dental arch in imbeciles is one point with regard to which they do come in contact. As medical officer of an asylum I take a great interest in this subject ; and knowing this, Mr. Turner asked me to be here this evening. Some four years ago Dr. Claye Shaw made a number of measurements of the palates of imbeciles at the Leavesden Asylum, and I assisted him. His results were published in the "Journal of Mental Science" for July, 1876 ; and Mr. Oakley Coles, in his recent communication, has referred to this paper. He remarks that there is a great similarity between the results of the measurements which he has made, and those arrived at by Dr. Shaw, as to the average size of palates. As to the width and length of palates, the measurements by the two observers are almost identical, but there is strong discrepancy as regards the average height. Dr. Claye Shaw gives much higher palates than those given by Mr. Coles. Mr. Coles tries to explain this difference on the supposition that Dr. Shaw's measurements were made by measuring the palate from the grinding-surface of the teeth to the roof of the palate ; whereas Mr. Coles' own measurements were made from the junction of the neck of the tooth with the alveolar process to the top of the palate. But I can state positively that Dr. Claye Shaw's measurements were not made from the level of the grinding-surface of the teeth ; they were made from the junction of the neck of the tooth with the gum. But his measurements were all made in living subjects, whereas Mr. Coles' were made from dry skulls, and therefore the only difference in the mode of measurement would be the thickness of the gum covering the alveolar process. I do not think this would be sufficient altogether to account for the difference between Dr. Claye Shaw and Mr. Coles. Then we should have to go further and seek an explanation elsewhere, and I think it may be found in this,—that Dr. Shaw's measurements were nearly all made upon imbeciles and idiots ; whilst, I believe, that Mr. Coles drew his average chiefly from normal adults, though a number of measure-

ments of the palates of imbeciles were probably reckoned with the others. I think that that accounts for the difference in height between the two observers. Dr. Shaw, in his paper, says that he considers that the worst idiot may have a well-formed palate, and to prove that quotes the case of one woman, an idiot of the lowest type, namely microcephalic, who, as he says, has a very well-formed palate, in fact one of the lowest palates which he found. I do not agree with him. The woman is edentulous; she has had no teeth for years. Her alveolar processes are consequently atrophied; and her sister, who is a microcephalic idiot, of about the same size and type, has teeth, and has a high palate. Therefore I do not think that case proves Dr. Shaw's argument, although I would not say that such cases could not be found. Since reading Mr. Coles' paper I have made a number of measurements myself, some of normal palates and some of imbeciles, on Mr. Coles' method, but all in the living subject. I made some thirty-five measurements, and have drawn out the triangles and diameters as recommended by him. I must say I think that the triangle is very useful for the purpose of measuring the dental and alveolar arches. It gives us the length and the width at one or two places, and the point at which the inter-bicuspid line cuts the triangle, although it does not take into account the height or the shape of the palate. So that the triangle is of little use in describing the form of the palate, but is very useful in giving us some of the dimensions, at any rate, of the dental and alveolar arches. One of the conclusions that Mr. Oakley Coles comes to is this, that the best type of European jaw gives an equilateral triangle, when measured by his method. I cannot agree with him in that. From the few observations of normal palates that I have made, I find that the base-line is considerably longer than the sides of the triangle. It is only in a few cases of deformed palate, where there has been some degree of prognathism, that I have found the sides of the triangle equal to, or longer than, the base. I must say that in the healthy sane people whom I have examined, they are not a very large number certainly, but I have always found

the base longer than, and sometimes considerably longer than, the sides of the triangle. Again, as to the position at which the interbicuspid line cuts the triangle. Mr. Coles tells us that it ought to cut this line as nearly as possible at its centre, five-tenths from one end. I have found this line posterior to the central point, — sometimes considerably, but always posterior to it, not only in healthy palates, but also in the deformed ones of idiots and imbeciles. In only one case out of fifty have I found the line pass in front, and that was a case of intermaxillary upognathism. I have had some little difficulty in understanding the difference between the brachoid and the dolichoid palates, but I think I now understand it. I have no doubt Mr. Coles would be able by looking at the model of a palate to tell us at once whether such a palate was brachoid or dolichoid, as he understands the terms, or as he wishes them used; but I doubt whether by looking at the triangles drawn from those palates after his own method he would be able to tell us whether any given palate was a brachoid palate or a dolichoid palate. I have been unable to do so at present. As to the part played by the intermaxillary bones in the formation of the shape of the palate, there is a marked difference in the opinions expressed by Dr. Claye Shaw and Mr. Oakley Coles. Dr. Claye Shaw lays great stress on the shape and form of the superior maxillary bones, and of the palate bones. He says, in fact, that the intermaxillary bones may be left out of the question as not influencing the shape of the palate in any way. Mr. Coles, as we have heard read to us this evening, says that they play the chief part in determining whether a palate shall be long or short, or whether it shall be prognathous or upognathous. In this matter I am inclined to agree with Mr. Coles and not with Dr. Claye Shaw.

Mr. CHARLES TOMES said, Mr. Coles was kind enough to show me his paper in part before it was published, asking me what I thought of some points in it, and I have looked it over with some amount of care since it appeared in full in the "Transactions." It appears to me that any approximation

towards a diagrammatic form on which we can express some of the facts about the jaw is a very great gain. It would be a very great gain, indeed, if we could by means of a compact diagram see at a glance all the more important facts that we wish to know about a jaw, either for the purpose of treatment or for the purpose of comparison ; but looking at the points which Mr. Coles has chosen, though they are useful, I think, for certain purposes,—very useful for the investigation to which he seems to have been principally directing his attention, they do not appear to me to be quite the most useful for general purposes. One criticism that I should advance is this :—For his base line he takes the medium part of the second molars ; that is to say, he wishes to give as closely as he can the medium line of the alveolar-ridge for the extremities of his posterior base-line, and he measures forward from that to the incisors for his anteroposterior lines. But for his interbicuspid measurement he takes, not the median line of the alveolus, not the middle of the crowns of the teeth, but the inner surface of their necks. Now, the result of that is that he gets a greater length of alveolus when he comes to compare the anteroposterior length from his posterior base-line with his interbicuspid measurement, because any difference in the size of the crowns of the molar teeth will throw backwards and outwards his base-line, and thus increase the anteroposterior length ; but the place at which he takes his interbicuspid measurement is such that a corresponding variation in the bicuspids will not be represented ; that is to say, his interbicuspid line will be comparatively unvarying, not varying concomitantly with the other measurements. Therefore, the comparisons drawn will be, to a certain extent, fallacious. The interbicuspid measurement should have been taken from a similar point to that at which the base line is measured. Then Mr. Oakley Coles has, for his own purposes, and perhaps rightly, excluded the wisdom-teeth, and measured by the posterior surface of the second molars, because the wisdom-teeth are variable ; but why, if the wisdom-teeth are variable, should their variations be left out of all account ? You are investigating the whole thing because there

are variations, and why should you exclude the most variable element? I think I understand why Mr. Oakley Coles did exclude them. Because he wished to get rid of certain variable elements, in order that he might investigate variations in other directions; but this very exclusion, while suiting the diagram for his particular purposes, unsuits it, among other things, for the purpose of comparing the human jaw with that of other animals. So much for the matter of measurement. Then with regard to Mr. Coles' classification: he divides jaws into dolichoid and brachoid jaws. Now those two terms are meant to contrast with one another; but the forms of jaw that he defines and describes are not contrasting forms, and therefore the terminology is, so far, misleading; that is to say, his dolichoid jaw is a mere matter of proportions of comparative width and length; his brachoid jaw is one the anteroposterior measurement of which falls below the average; this is not a matter of proportion, but of absolute lengths. Therefore those two terms which one would expect to mean an opposite condition of things do not. And the same objection in another form has presented itself to Dr. Cobbold, who finds it difficult to apply the description of brachoid jaws. Then several previous speakers have taken exception to the term intermaxillary prognathism, and it seems to me that it is open to a great deal of exception,—that it is very much “not proven.” To begin with, a certain form of prognathism is described by Mr. Coles as occurring in civilised races in which the teeth are prominent and stand apart, and the jaw looked at by itself, quite without regard to the rest of the face, is not what one would describe as a perfect arch with perfect teeth set in it. But, as a matter of fact, the true prognathous jaws of the lower races are conspicuously fine arches. If you look at the alveolar arch, and the teeth set in it, they are of the utmost regularity, they are not spread out fan-shaped. It seems to me, then, that the comparison rather falls to the ground there. We are comparing a condition which is distinctly morbid with a condition which is not morbid in the lower races, and which in the lower races leads to a remarkably fine jaw instead of a

remarkably poor one. Then Mr. Oakley Coles tells us that his triangulation of the jaws of some of the lower animals brings out a remarkable resemblance to his intermaxillary prognathous jaws. That coincidence in measurement, amounting almost to identity, seems to me, instead of proving his point, proves something else which is not his point, and which is not this matter of identity; because if you take a monkey's jaw and compare the sizes of his different teeth you will find that the proportions they bear to one another are quite different to those of man. Moreover, in the monkey's upper jaw there is a great interval where the lower canine fits up in front of the upper. Now if, despite all that very remarkable difference, the triangulation brings out results of identity, there must be surely other things at work. We have a triangulation which gives results identical, and we look at the jaws and we find that there are most conspicuous differences; therefore I think we should look further instead of saying at once, "here we have an explanation of this prognathism occurring in civilised races, and here is a reversion towards the lower type," and so forth. Then, when it is laid down that this condition carried further would lead to hare-lip and double hare-lip, I cannot see exactly on what that is based. I do not see that it is proven, and I think Mr. Coles has made a mistake in the matter of logic when he uses this, which is, after all, only an assumption, and which, after all, can only have a certain degree of probability as a premise in a further argument to prove that in those cases suturation will be arising later than usual, and that therefore all these changes which he supposes to take place can take place. I need hardly say that in man the intermaxillary suture joins up so early that it is difficult to understand how the intermaxillary bones can be moved forward or anything done to them. Then there is another matter which Mr. Oakley Coles leaves out of account in his estimate of intermaxillary prognathism, and that is this:—Supposing you drop a vertical plane from above,—from the front of the orbit down to the jaws,—what point will it strike in the monkey, and what point will it strike in his intermaxillary prognathous

jaw? Unless it strikes the same point then it seems to me that the comparison again becomes weak. Then it is stated that the position of the second bicuspid always corresponds with the position of the second temporary molar. It is so, doubtless, in a normal jaw where no conditions adverse to its assuming that position come into play, but is it so in every one of these malformed jaws? That, it seems to me, requires proof. I do not wish to criticise Mr. Coles' paper in the smallest degree in any hostile spirit. I think that he has done a good work in endeavouring to reduce to a diagrammatic form all these differences, but I do think that the matter of intermaxillary prognathism should either have been made out more clearly, and the data given more fully, or that it should have been put forward in a very much more hypothetical form. It seems to me that from what he has given here it must be abandoned; at all events, I do not think that it can be considered as established. There are many other points of criticism which are more or less minute, and which I will not detain the meeting with, but which, it seems to me, would go far to overthrow it. I am sorry in one respect that Mr. Coles' paper embraces so much. I think it would have been better had he put forward his method of measurement of a few similar forms of jaw and to establish his priority in the matter, and left it to be experimented upon and worked out rather more before committing himself to so much, because, while I believe the attempt to be one in a right direction, I think that in the carrying out of it in detail there is still much to be considered, and that the scheme, as now put forward by Mr. Coles, will have to be in some points considerably modified before it can be generally adopted.

The PRESIDENT.—I think we may congratulate ourselves on the very interesting discussion that we have had on this paper. At this late hour it would be a mistake for me to add anything to what has been said; and this is the less called for, as I feel that the subject has been thoroughly well discussed. I will, therefore, at once request Mr. Oakley Coles to reply to the observations which have been made.

Mr. OAKLEY COLES.—I am afraid it will be rather difficult for me to reply in detail to the elaborate discussion which has taken place to-night; but I will endeavour, as far as possible, to follow the points which have been raised. In reference to a remark made by yourself, sir, I endeavoured to show in my paper, as far as possible, that I wished to refer to the *forms* rather than to the *absolute measurements* of the jaw. I have directed my attention rather to the form, and to the relation of the measurements to each other than to the absolute sizes, which, of course, would be a matter of great difficulty. Then, with reference to the influence of the sphenoid in its growth on the bones of the face, my observations or conclusions are for the most part based on my reading of Mr. Hilton's work on the skull, in which he attributes very largely to the growth of the sphenoid, the development of the bones of the face, and the character of the features that are produced. Then, there was a query as to the number of cases of prognathism on which my observations were based. I have had an opportunity of observing, and that in a most perfect manner,—especially in the case of one female, a family in which a brother and sister, and the two children of the brother have features of the same character as to the lengthened nose, and so on. Prognathism is distinctly marked in the brother and sister, and it is in process of development in the two children of varying ages, as to the nose and as to the prominence of the jaws. I have models in the case of one child; but I have placed them in the hands of the local practitioner in the country, who is watching the case for me, or I should have been able to show you them. With reference to the ape-like faces of the prognathous, and the inquiry as to what central lesions I referred to, I referred to those lesions which are seen in idiocy and imbecility, such as you find especially in Dr. Langdon Down's Asylum. A large number of his cases come from the higher classes of society, and amongst them you get some of these race characteristics more distinctly shown than in some of the larger asylums when the children come from a lower class. I have carefully avoided alluding to any value of prognathism or the form of the palate as indicating

what will happen, because it would be extremely injudicious by merely basing one's observations on the palate to attempt to form a prognosis as to what would be the future of a child. At certain periods of life idiocy will become developed apart from any congenital taint ; and in those cases you find no evidence, in the first instance, that would be of any value for prognosis. The variations between the civilised and the uncivilised jaws are noted in my paper in the classification, in which I go into the dimensions of the jaws of "mixed races," as they are put there, so as not to run too closely into the matter of distinction. The dimensions given there show how very much larger the measurements are in the "mixed races" than in the European races. With reference to Mr. Balkhill I would say that the curves to which he refers are familiar to me, and that I have got them here (diagrams shown). Here the curves are shown in these diagrams. I have taken the dental outline where it was possible, but as it was not desirable to embarrass the paper with those extra particulars, they were omitted ; but they have not been lost sight of. Now, I come to my esteemed friend, Mr. Sewill, and I am sure it would not be well for me to occupy the time of the Society in answering all Mr. Sewill's criticisms. I was extremely glad to listen to the contribution to the debate by Dr. Cobbold, as it was extremely difficult to get over the difficulty caused by the dissimilarity between the measurements of my cases and those of Dr. Claye Shaw ; but the fact is now explained by the statement that Dr. Claye Shaw's measurements were for the most part from the mouths of idiots, while the averages which I quote in my table are entirely taken from normal jaws. Then I presume also there is the difference in not merely the thickness of the mucous membrane covering the palate, but in the extent to which the mucous membrane passes beyond the alveolus on to the neck of the tooth proper, which would give a difference of two or three lines, and that probably will make up the whole of the difference. I had no idea of bringing this paper forward as a perfect classification ; or presuming for a moment that it would be accepted as such.

My object was to bring forward something that by discussion would ventilate the subject and would induce other workers to investigate the matter, so that ultimately we might arrive at a classification which would be satisfactory. I quite admit the cogency of the remark of Dr. Cobbold that the description of the palate does not appear from the diagram. That is perfectly true, and it is a point which I do not see my way to get over, except by giving the dental outline from the teeth; but then you have to deal with the variations in the size of the teeth, and the degrees of irregularity to which they may be subjected, which is a point of some difficulty. The influence of the intermaxillary bones, I must confess I am inclined to lay great stress upon, and I am extremely glad to have my view confirmed by Dr. Cobbold, although I know that it is opposed, and has been opposed, by Dr. Claye Shaw. The criticism of Mr. Tomes is extremely valuable, and one that I shall certainly take advantage of. I quite see the force of the argument that he uses as to the interbicuspid line not being taken in the same position relatively as the molars. The question that arises in my mind is whether it would be better to take both from the point of contact of the neck of the tooth with the margin of the alveolus, or to take both from the centre of the surface of the tooth. It is tolerably easy to do so with the molars, but it is not so easy to do so with the bicuspid. It is easy to ascertain what is about the middle of the molars, but it is not so easy to do that with the bicuspid; so that I should be more inclined to take the inner surface of the line of contact of the margin of the alveolus with the neck of the tooth, and then let that be the point of correspondence with the measurement already got from the bicuspid. That, however, is a matter for future discussion, which we shall probably be able to be agreed upon, because I shall be only too ready to accept that method which seems to be the most likely to bring us to a satisfactory conclusion. As to the prognathism in the lower races, it is unfortunate I have comparatively few skulls that show it well; but I think in many cases of prognathous jaws, such as in the Chinese and Hottentots, there is a certain

amount of interdental space which corresponds in some degree with the space that you find in the apes, and which also corresponds with the interdental space which you certainly get in pathological prognathism. Then that point of obtaining a vertical plane is a most important one, and a source of error which I fully recognize, but which I have failed hitherto to see a way out of, because the difficulty is to determine whether it is prognathism of the entire jaw pressed bodily forward on a horizontal plane, or whether it is prognathism of part of the jaw. That is a point very important to determine, but which at present I have no very accurate means of dealing with. I cannot see my way clear, nor have I found any one able to suggest an absolutely fixed point at the base of the skull from whence we may measure the distance to the interbicuspid line, whence would alone enable us to determine the degree of prognathism. I hope that some other person more competent than myself will go on with this investigation, and then, if I have done nothing else, I shall have the satisfaction of knowing that I have helped to bring the subject to the front, and induced those better fitted for the task than myself to complete this much-needed classification.

The PRESIDENT.—I must confess that I am very pleased to find that this discussion has been so interesting. There are some casual communications which should have been read before the paper this evening ; but the discussion has taken so much time that there is now no time to receive them. I hope, however, that the authors will give us the benefit of them at our next meeting on May 1st.

A vote of thanks was then given to Mr. Sewill for his casual communication, and to Mr. Oakley Coles for his contribution to the Museum, and the meeting terminated.



## ORDINARY MONTHLY MEETING.

*May, 3rd, 1880.*

ALFRED WOODHOUSE, ESQ., PRESIDENT, IN THE CHAIR.

---

THE Minutes of the previous Meeting were read and confirmed.

Mr. MORTON A. SMALE signed the Obligation Book and was formally admitted to Membership by the President.

The PRESIDENT announced that the following gentlemen had been proposed for election, and would be balloted for at a subsequent meeting :—

Mr. GURNELL E. HAMMOND, L.D.S. Eng., 43, Leinster Square, Kensington Gardens, W. Resident.

Mr. WALTER PAXTON HARDING, L.D.S. Ireland, Bronala, Carnarvon, North Wales. Non-resident.

Mr. THOMAS S. CARTER, L.D.S. Eng., 26, Park Square, Leeds. Non-resident.

Dr. WALKER read the following letter from Mr. OAKLEY COLES, who was unable to attend the meeting :—

“ Mr. PRESIDENT,

“ At a recent Meeting of the Society I referred to a patient of Dr. Ferrier, as an example of epilepsy due to dental irritation. I have since heard from Dr. Ferrier that it was a case of epilepsy *with* dental irritation, but not dependent on it. Under these circumstances my criticism of Dr. Ferrier's letter at the last Meeting falls to the ground, and I desire to withdraw it. I may further state that the patient on whom I

operated, though relieved from the one anticipated seizure, has since been as bad as ever, thus justifying Dr. Ferrier's diagnosis of the case."

Mr. SEWILL said that after what had been stated by Mr. Coles at the last Meeting and published in the *Transactions*, it was only just to Dr. Ferrier that the explanation should be made quite clearly. It was not the fact that Dr. Ferrier had made the suggestion as to the probable effect of removing the teeth which he was stated to have made, and it was not a fact that the patient had been cured: she was as bad as she had ever been; indeed, Dr. Ferrier considered this to be one of the most intractable cases of epilepsy which he had yet met with.

The PRESIDENT announced that Mr. F. Canton had presented to the Museum the jaw of a cat affected with cystic disease.

The SECRETARY then read a communication from Mr. Tod, of Brighton, which accompanied a model of the mouth of a patient, aged 22, whose teeth had been regulated in her youth, the left upper canine having been removed with excellent results. Quite recently Mr. Tod had removed the right upper canine, and he intends shortly to extract also the right upper first bicuspid. Mr. Tod called attention to the extra molar on the right side, which, although it greatly resembled a temporary tooth, he took to be a supplementary molar. It was quite firm and level with the rest of the teeth, and its colour and general appearance were unlike those of a persistent temporary tooth. He offered the model to the Curator for the Museum if it should be thought of sufficient interest.

The PRESIDENT said he should be sorry to differ from Mr. Tod, but, so far as he could judge from the model, the tooth had certainly all the characteristics of a temporary molar, and he thought that this was the more probable explanation of the case. The fact that the tooth was firm in the jaw was no argument against it.

Mr. G. H. HARDING made the following communication respecting the insertion of guttapercha fillings :—

I have met with considerable difficulty in the insertion of guttapercha fillings in proximal cavities in front teeth, owing to the tendency of the two fillings to stick together. The first filling is easily inserted, but when the second is undertaken the hot guttapercha one is using, and also the hot instruments, are so apt to stick to the first filling that I have sometimes found it difficult to avoid injuring the first filling, and even in some cases entirely displacing it.

To obviate this, I used formerly to hold some thin material—such as lead foil—over the first filling with the thumb and finger whilst inserting the second, but this method was not very satisfactory. The following plan, which I now adopt, is very simple and removes all trouble in this respect. Having filled and finished off one of the fillings, I cut a strip of gummed paper, ordinary stamp edging answers the purpose, of sufficient breadth to cover the first filling, over which the strip of paper, after being moistened is placed, and the ends strapped over the surfaces of the adjoining teeth, one end on the lingual, the other on the labial surfaces. This holds it firmly in position and gives the operator plenty of room to work at the cavity, which is then filled and finished off; after this, all that is necessary is to pass a strip of cotton wool well saturated with water several times between the teeth: when the gum is sufficiently softened the paper will slide off, leaving the first filling intact.

Mr. HARDING also showed a model of a curious case of irregularity. Although one of the deciduous molars had remained persistent, it had not prevented the eruption of the bicuspid, which had taken up their places one on each side of the temporary tooth. The fact that the bicuspid tooth is generally considered to vertically displace its predecessor rendered this case interesting.

The PRESIDENT said it was certainly a very interesting case; he had never met with one precisely similar, though he had seen

several instances in which the bicuspid had moved considerable distances, both backwards and forwards, without in the least losing their proper vertical position.

Mr. MOON said that some months ago a very ingenious little apparatus for regulating teeth had been sent to him by Mr. Williams, of Leamington. Having found that it answered its purpose very satisfactorily, he had brought it for exhibition to the society. It consisted of a vulcanite plate to which a short tube was attached opposite the teeth to be acted upon; inside this was a sliding tube and through this an elastic band played.

The PRESIDENT remarked that, although the apparatus looked a little more complicated than some others which had been designed for the same purpose, it was certainly very ingenious, and, no doubt, also very efficient. One advantage was that no harm could be done, however long the patient might wear it, as the teeth could not be brought back beyond their proper positions; hence frequent visits would not be necessary.

Mr. VANDERPANT showed, for Mr. Crapper, of Hanley, a specimen of osseous union and transposition of two teeth.

#### OSSEOUS UNION AND TRANSPOSITION OF TWO TEETH.

The specimen which I have the pleasure of submitting to your observation I removed from the left side of the lower jaw of a young woman about twenty-two years of age. She came to me complaining of great pain of a neuralgic character; her face was much swollen and accompanied by partial deafness on the affected side. There was some difficulty in examining the case owing to the patient's inability to open her mouth sufficiently; however, I perceived what appeared from its position to be a badly-decayed wisdom-tooth; the surrounding parts were much swollen, covering the space which ought to have been occupied by the second molar (the first molar was present). With some difficulty I succeeded in removing the tooth referred to, when, to my utter astonishment, I brought another tooth

away with it; on inspection I found that what I had believed to be the wisdom-tooth was in reality the second molar, while the real wisdom-tooth had erupted in front of the second molar, and had pushed the latter backwards. The specimen is, I believe, one of true osseous union, which becomes more interesting by the abnormality of the relative position of the teeth. I saw my patient a few weeks subsequently, and all bad symptoms had subsided.

The PRESIDENT said he thought that Mr. Crapper was mistaken as regards the transposition. It appeared to him that the diseased tooth was the second molar, and that the one behind was the wisdom-tooth.

Mr. VANDERPANT also showed for Mr. Crapper a lower plate encrusted with a large mass of salivary calculus, and read the following account of the case:—

#### SPECIMEN OF SALIVARY CALCULUS.

Some years ago a lady consulted me respecting her teeth. I found it necessary to remove the fangs of the lower incisors, in order to adapt a temporary case, which was secured by clasping the canines. The teeth were fixed on gold-plate, and the gutta-percha still present in the specimen was placed underneath to relieve direct pressure on the somewhat tender gums. Contrary to expectation, the patient did not return at the time appointed to have a permanent case supplied. I lost sight of her for about five years; in the interim she had constantly worn the piece. Finally, she was obliged to consult me again, owing to the loss of the canines. On examination, the large mass of salivary-calculus was found deposited, which I removed in conjunction with the plate. The loss of so large a substance startled my patient, and she imagined that a large portion of her jaw was coming away. The gums were considerably congested. It is a remarkable fact that notwithstanding the bulk of the deposit it had not materially interfered with her comfort,

and had she not been compelled to visit me again she would have continued wearing her case, without in the least suspecting the presence of the interesting specimen which I have the pleasure of submitting to your inspection.

Mr. CRAPPER had also sent for exhibition a celluloid plate made by Best's process, some cases of continuous gum work, and also of blocks, and a curious old plate made 150 years ago, which he presented to the Museum.

Mr. VANDERPANT also showed a plate encrusted with salivary calculus, which had belonged to one of his own patients.

Mr. S. J. HUTCHINSON showed a similar specimen. In this case the plate had been worn for four years without removal.

The PRESIDENT then called upon Mr. Arthur S. Underwood to read his paper on Nerve-Stretching in Neuralgia.

*On Nerve-Stretching in Neuralgia.* By ARTHUR  
S. UNDERWOOD.

MR. PRESIDENT AND GENTLEMEN,

HAVING been much occupied lately in hunting up records in the various medical publications upon the subject of neuralgia, I have repeatedly met with notices of obstinate and rebellious cases, that, after every other remedy has been tried and failed, have succumbed to nerve-stretching. Such cases, isolated among other matter, and occurring singly, at intervals of months, produce a less forcible impression upon the mind, than when placed in juxtaposition, and considered in mass. This, combined with the fact that it takes a long time for such cases to make their influence felt on the current books, must be my apology for the communication I have the privilege of reading to you. I may add, perhaps, that the members of this Society have so much to do with neuralgia, that the profession must gain from the discussion of this interesting question by those who are constantly occupied in studying it.

A great variety of irritating causes may bring about neuralgia, a carious tooth, a piece of dead bone, an abscess, lead-poisoning, chlorosis, rheumatism, syphilis; but whatever the cause may be, it is the opinion of Trousseau that the neuralgia itself is always *only a symptom*.

A foreign body, such, for instance, as a pivoted tooth, may cause no neuralgia at all; again, it may cause a slowly-developing neuralgia, and one easily dealt with; lastly, it may cause neuralgia of that rapid and resistless form so graphically described by Trousseau as “epileptiform,” and of which he says that it resists “with a disheartening obstinacy all therapeutic measures, so much so indeed that even now, after more than thirty-six years of practice, *I have never known it to be cured in a single case radically.*”

Here is such an uncompromisingly unfavourable prognosis, from such an authority, that it is no small evidence in favour of the operation to which I wish to draw your attention, to find that the disease in its most aggravated form *has* been cured radically by nerve-stretching.

Simple trifacial neuralgia will, in the majority of cases, yield, fairly readily, either to the extraction of some guilty tooth, or to the administration of some one of the innumerable drugs with which every one is familiar. But there are cases, and not so infrequent as we could wish, when all these

means fail ; when the only palliative, for a long time, was the division of the nerve, an operation affording, too often, only temporary relief, as the mischievous condition remained and only waited for the reunion of the cut nerve and the re-establishment of the interrupted nerve-current to display its terrible phenomena again.

To illustrate this form of neuralgia I will quote three cases. In one drugs only were employed, in another neurotomy, and in the third nerve-stretching.

In 1852 a gentleman of about 40 years of age, a captain in the army, came into my father's surgery. He had scarcely sat down in the operating chair when he suddenly sprang up as if electrified, his face became deeply flushed, and a profuse perspiration poured out from every pore in his skin, his teeth were clenched together, and he convulsively swept his handkerchief over his forehead uttering a subdued groan, which ended in a deep sigh of relief; the paroxysm was over, it had lasted a few seconds only, but its short presence had been terrible enough. This brief moment of agony he assured my father recurred with the utmost regularity *every five minutes night and day*. For ten years he had not known what it was to be ten minutes free from this torment; between the paroxysms he slept and

even dreamt at night,\* he had consulted every medical man of any eminence in Europe, he had taken every reputed drug, and nothing had had the slightest effect. His misery had more than once driven him to the verge of suicide. Such a ten years' suffering might well overturn a man's reason.

The second case is one that happened to Trousseau, to quote his own words, "This poor patient had for many years been subject to the convulsive form of neuralgia. His paroxysms lasted sometimes a few seconds only, and sometimes a minute, they recurred whenever he spoke, drank, or ate, or whenever one touched with the tip of a finger the few teeth which he had left. The pain was seated in all the branches of the trifacial nerve of one side, but chiefly in the infra-orbital division. Several of the nerve trunks had been divided already, but the relief *had been only temporary*, and the pain had always obstinately returned after an interval of from a few weeks to a few months. The extraction of his last remaining teeth gave him no relief. Prolonged application of a solution of cyanide of potassium did some good. But the pain still returning, as awful and as unbearable as ever, I decided upon

\* It may be interesting to state that these brief dreams were the happiest moments of the sufferer's life,—seeming, as they did, to extend over whole years and years of peace.

dividing the infra-orbital branch. Bonnet performed the operation with great skill; the patient was relieved instantly, and remained free from pain for several months. The following year I saw him again, suffering in the same way in the course of another nerve of the face, and with the same convulsions. Professor Roux, as far as I can remember, again divided several nerves. Lastly, in 1841, Dr. Piedagnel saw in his wards at La Pitié, this same individual whom he had known thirty years previously, when house physician at the Saint Antoine Hospital. The poor man's face was scarred from the surgical operations which he had undergone, for whenever the pain became intolerable he implored the help of the knife, for this at least gave him relief for a few days, and sometimes for months." Here is a history of agony bearing ample evidence of the necessity of some mode of operative interference more potent to deal with this obstinate disorder than neurotomy, the knife is sometimes plainly only at best a palliative. The first case defied drugs, the second was only half conquered by the knife. The third case I shall quote is quite as intense an instance of suffering; in fact, it is impossible to conceive that the history of physical pain can contain anything worse.

In the May of 1879 Dr. Grainger Stewart, returning from his autumn holiday, found that a

patient had been placed under his care suffering from epileptiform neuralgia. For fifty-three years this man had lived a comparatively happy life, a temperate, prosperous man enjoying perfect health, among pleasant surroundings. He was a stationmaster in the north of England, and had been, in the pursuance of his duties, somewhat exposed to weather and draughts. In 1862, at 53 years of age, he was attacked by facial neuralgia. Once begun, the disease gradually increased in severity, the paroxysms occurred each time after less and less intervals of peace ; but for the remission life would have become intolerable. The attacks lasted between six and eight weeks, the periods of freedom varied from a few weeks to a year. Never feeling secure from his enemy, his mind had no real peace. I will quote Dr. Stewart's vivid account of a paroxysm :—" His face would suddenly change, twitching of the muscles on the right side of the face set in, leading to the strangest grimaces ; the agony began simultaneously with the movement, and was most intense in the lines of distribution of the middle branch of the fifth nerve on the right side. The patient would seize his head with his hands and press the painful part with the utmost violence ; would drive his knuckles into the space beneath the malar bone ; would slap his face, tear his hair, twist his body in all directions, and sometimes

lose all self-control and shout in his agony. This would continue for a few seconds, or perhaps a minute or two ; then the pain and other symptoms would subside. The paroxysm might recur almost immediately, or not for hours ; generally they were most severe in the evening or during the night. They were induced easily by touching the skin, or pulling the hair of any part of the area of distribution of the affected nerve, or by touching the gums or tongue. Mastication had thus become impossible, and all food had to be taken in a liquid form ; and no effort was spared, by the use of tubes or other contrivance, to smuggle it past the sensitive region ; nine teeth had been extracted in the hope of obtaining relief, but without benefit." Here is a tale of distress almost bordering on romance. The unfortunate old man had submitted to various treatment without effect ; he had had teeth extracted, taken opium, had morphia injected, and had tried most of the specific drugs. Dr. Stewart, encouraged by a previous success in a case of sciatica, resolved upon stretching the affected nerve. First, the infraorbital nerve was stretched at the foramen, and the operation was followed by a month's immunity ; after that period the paroxysm returned, but the locality of the pain seemed transferred to the mental foramen. The mental nerve was cut down upon and stretched,

and since then the patient *has never suffered a twinge of pain.*

Here is then a case quite as violent as either of the other two in which permanent relief has been afforded by this simple operation. The testimony is surely very strong.

In searching through the records of cases published during the last two or three years in various papers and pamphlets, I have found the notes of 39 cases in which nerve-stretching has been done. Of these 14 were done for facial neuralgia, 12 for tetanus, 10 for sciatica, and 3 for neuralgia of the arm. Of these 32 were complete and permanent successes, 2 were relieved of pain, but died from accidental causes (one from secondary hæmorrhage, and the other from erysipelas). In the five remaining cases the operation was done for tetanus. In one the disease had progressed so far that the medulla was already greatly implicated; of the other four, two were performed by Mr. Nankivell, and two by Mr. Watson, and in each case the disease was abated and life prolonged for some days, though the patient finally succumbed; and notwithstanding the fatal result, Mr. Watson says, at the end of his report, that the operation did undoubted good, and that he should not hesitate to perform it again. On no occasion then has the stretching of a nerve done harm, and this is an important point, for the other operative proce-

dure, with which one feels instinctively that nerve-stretching must contest the palm, I mean neurotomy, or nerve-dividing, *has* been attended with unpleasant results. For instance, it has happened that the healing cicatrix has enclosed and gripped the cut and swollen nerve ends with its re-forming fibrous tissue, and produced a new neuralgia, perhaps worse than the first. Again, if the nerve divided be a mixed nerve, paralysis of the parts supplied by it must follow its division, and in any case loss of sensation will result until the nerve unites again, and then, in all probability, the pain will also return. Dr. Brunton also referred to an experiment of Schiff's, of division of the inferior dental nerve in one of the lower animals, which was followed by dimness of vision, due to partial paralysis of the ophthalmic branch. The only permanent good that can arise from division of the nerve, if it is to reunite, must depend upon the division of the vessels supplying it. That neuralgia is always attended with a vascular disturbance is, I think, quite established. Only a few weeks ago the members of this Society had the privilege of listening to a most original and lucid account from Dr. Brunton of these vascular phenomena; they were described as being a kind of vascular colic, the vessels being tense at one point and relaxed at another. Trousseau found neuralgia yield on some occa-

sions to division, not of the peccant-nerve, *but of the arteries supplying the part*. Dr. Erb states that Nussbaum and Trousseau have even gone the length of *tying the carotid* to allay obstinate trifacial neuralgia, and have met with wonderful success. Moreover, the same author states it to be his opinion that, ignorant as we are of the pathology of neuralgia, it is highly probable that the secret of the nervous disturbance is a state of neuritis. Whenever any changes have been observed in nerves affected with neuralgia they have been those of simple inflammation. The vessels of the neurilemma have been found injected; a plastic effusion has been found surrounding or lining the nerve-sheath, adhesions have been found between the neurilemma and the surrounding tissues.

Dr. Erb further suggests, that not improbably in those cases of neuralgia where no changes at all have been discovered, neuritis had been present, but was either too slight or too transient to be obvious to our present methods of investigation. From these facts it would appear that neuralgia is a vascular phenomenon; and herein, perhaps, may lie the key to the great success that has attended nerve-stretching as a treatment in obstinate cases. It is easy to conceive that nerve-stretching may act as a revulsive; besides freeing the nerve from any adhesions that may have been

formed between it and the surrounding tissues, the wrench may permanently rectify the morbid state of the small vessels. It is evidently more desirable to correct the disturbance, the presence of which is evidenced by the pain, than to prevent the nervous system from testifying to the presence of the mischief by temporarily interrupting the current, leaving the mischievous condition uninterfered with. Herein lies all the difference between a permanent and a temporary cure. The *rationale* of the treatment at present, however, lies too far in the regions of speculation. There is a veil of obscurity lying over the exact pathology of this disease, which science has hitherto attempted in vain to pierce. The best authorities confess that, as yet, we do not know anything for certain about it. This want of knowledge does not, however, diminish the pressing necessity of agreeing as to the best practical method of allaying the agony it causes. Till more is known of the minute pathology of the disorder, rival methods of treatment must be judged by success alone; and from this practical point of view there can be no doubt that hitherto the results of nerve-stretching entitle it to rank very high as a last resource in those rebellious cases where all reputed drugs have failed, and life has become a burden to the sufferer.

M. Blum, in his interesting memoir upon this

subject in the January and February numbers of the "Archives Générales de Médecine" for 1878, tabulates thus the circumstances under which nerve-stretching is justified and called for:—

1. In neuralgia that resists therapeutic treatment, and is limited to a certain nervous tract.

2. When the neighbouring nerves show a tendency to become implicated.

3. In neuralgia of traumatic origin, especially when there is reason to suspect cicatricial adhesion between the nerve and the surrounding tissues.

4. In neuralgia affecting stumps.

In his *résumé* he states that the efficacy of the operation is due principally to the modifications which it brings about in the structure of the nerves, and above all in the circulation, not only at the spot where the stretching was done, but even at points more or less distant from the wound.

The discovery of this operation depended upon a curious accident. In the year 1869 Nussbaum was operating for excision of the elbow-joint. The patient had been suffering from permanent contraction of the little and ring finger on the side about to be operated upon. During the operation, the assistant was directed to keep the ulnar nerve out of danger from the knife by protecting it with a spatula. Owing to some acci-

dental cause, the patient's arm was suddenly jerked, causing a violent wrench to this ulnar nerve. The accident was scarcely noticed at the time; but when, after recovery from chloroform, it was observed that the contraction had disappeared, and did not return, the operator's attention was drawn to the fact, and he was led to try the effect of a similar wrench in similar cases, with a like result. After this the operation was performed by Nussbaum, Billroth, Callender, Lister, and many others, for sciatica, tetanus, epilepsy, neuralgia, &c., and the success that attended their experiments placed the operation upon its trial as a recognised procedure in surgery.

Before closing this paper, which I feel has already detained you too long, I should like, with your permission, to say one word concerning a curious and important symptom, much insisted upon by Trousseau,—which I have noticed in all the reports of cases I have read has been universally omitted from mention. It is as inexplicable as most other points connected with neuralgia; but as Trousseau states, after an experience of nearly forty years, that it is invariably present in violent cases, it is certainly deserving of notice. I mean pain following pressure made over the spinous processes of the neighbouring vertebræ. In cases where the fifth

or the occipital nerves\* were affected, pain is always felt on pressure of the occipital protuberance, or the spinous processes of the first two cervical vertebræ. When the nerves of the brachial plexus were affected, pressure on the spine of the last cervical vertebra gave pain. So also with intercostal, lumbar, and sciatic neuralgia, the corresponding vertebra were always painful to pressure. This pain did not, however, occur at first—not until, probably, the mischief had spread to the spinal cord; and until this pain occurred, Trousseau did not consider the case to be one of neuralgia, but of mere local pain. To illustrate this, he quotes a case of toothache arising from the presence of a false tooth with a pivot. At first the spinous processes were not tender, but when the pain had spread along the inferior dental nerve, had involved the superior maxillary, and, lastly, the ophthalmic, the processes became tender on pressure, and the case was one of neuralgia. I think this point is surely worthy of observation in the record of cases. Trousseau himself offers no explanation of the phenomenon in the case of the fifth nerve; in fact, he states that anatomically it is impossible to explain it.

\* Trousseau states that these nerves are almost invariably affected together.

It remains for me to add that the cases I have referred to have all been severe ones. In one instance, the list of drugs that had failed to produce any effect would have startled the Pharmaceutical Society—nitrite of amyl, opium, morphia, arsenic, chloride of ammonium, gelseminum, quinine; but I need not enumerate the formidable array. All the drugs and applications proved useless, and nerve-stretching effected a permanent cure. I have only selected cases of an aggravated kind, and of these only such as have been published during the last three years; and I think, considering the results, the Society will confess the operation has wonderful facts to speak for it.

Thanking you for your patient attention, gentlemen, I may add that the relation of your personal experiences on the subject of neuralgia will, I am sure, give a value to the evening which I could not have hoped to have resulted from my paper.

The narration of the details of a succession of cases greatly resembling each other being excessively wearisome to any audience, however patient, I have refrained from incorporating any such list in my paper, in the hope that I may be permitted to append it to the published account in the *Transactions* of the Society.

## LIST OF CASES OF NERVE-STRETCHING.

<i>The Practitioner.</i> Vol. xviii. Two cases recounted by Mr. John Chiene, of Edinburgh. Complete cure, no motor or sensory loss	...	...	...	...	...	2
<i>Archives Générales de Médecine.</i> Jan. and Feb., 1878. M. A. Blum gives the results of 18 collected cases. Three died from accidental causes; in two the neuralgia was cured, but the patients died, one of erysipelas, and the other of hæmorrhæge; the third was a case of tetanus not treated in time	...	...	...	...	...	15
<i>Lancet.</i> July, 1878. (Vol. ii., p. 6.) Dr. Macfarlane gives notes of a case of obstinate sciatica that had for nine months resisted all treatment (morphia injections, aconite, opium, belladonna, quinine, iron, chloride of ammonium, strychnia, arsenic, phosphorus, potass, iodidi, zinc, actæa racemosa, turpentine, all tried and failed) complete cure	...	...	...	...	...	1
<i>Lancet.</i> Vol. ii., p. 323. (1877.) Two cases by Paul Vogt and Hy. Petersen, cured	...	...	...	...	...	2
<i>Lancet.</i> March 2nd, 1878. Nankivell, two cases; both failed. Operator thought failure was due to his not having stretched nerves sufficiently.						
<i>Lancet.</i> Feb. 16, 1878. Watson, two cases of tetanus; neither lived, but in both the disease was mitigated.						
<i>Edin. Med. Chir. Soc. Trans.</i> May 15, 1878. During discussion on Eymington's paper, Bell mentions one case and Chiene four others cured	...	...	...	...	...	5
<i>Brit. Med. Journal.</i> 1877. Vol. ii., p. 866. Heath, of Manchester Infirmary, gives one case of sciatica, complete cure	...	...	...	...	...	1
Carried forward	...	...	...	...	...	26

Brought forward	...	...	26
<i>Brit. Med. Journal.</i>	May 31, 1879.	Dr. Grainger	
Stewart gives one case of neuralgia quite cured	...		1
<i>Ditto.</i>	June 14, 1879.	Chas. Higgins, of Guy's, two cases	
of supraorbital neuralgia quite cured	...	...	2
<i>Ditto.</i>	Oct. 18, 1879.	Reference to a case published by	
Kocher in the <i>Correspondenz Blatt</i> , 11 Nov., 1879,		supraorbital neuralgia, cured without loss of sensa-	
tion	...	...	1
		Cured	...
		Failed	...
			30
			7
			37

## DISCUSSION.

Mr. COLEMAN said, that during his presidentship Mr. Callender had promised to read a paper on this subject before the Society, but he unfortunately died before he redeemed his promise. He could recollect many cases in his own practice in which he had little doubt that this operation would have done good. One lady, in particular, he remembered, who suffered most severely from neuralgia. All sorts of remedies were tried in vain ; iodine of potassium seemed to do some good for a time, but nothing else produced the smallest effect on the disease. All her teeth were removed one after another, and after each operation she enjoyed from six weeks to two or three months immunity from pain. He did not know whether this was due to the effect of the shock of the operation on the nerve, or whether it might be owing to the stretching of the small branches to the fangs which took place at the moment of extraction. He should have been glad if Mr. Underwood had given a fuller account of the operation itself, especially as to the precautions to be observed in dealing with small branches, such as those of the facial as they appeared at the different foramina.

Mr. CHARLES TOMES said he had had a case under observation the full history of which he hoped to relate to the Society at some future time. The patient had suffered from exceedingly severe neuralgia, affecting the course of the inferior dental nerve, for four years past. All his teeth had been extracted, all sorts of drugs had been tried, together with galvanism, &c., but without any benefit. Mr. Tomes then exposed the nerve at the mental foramen and stretched it,

but this had no effect. Accordingly, a few days after he reopened the wound and removed a quarter of an inch of the nerve, taking particular notice that the cut ends did not touch each other. After this the patient had extra cessation of pain for a month when it gradually returned, and on cutting down upon the nerve again, three months after the first operation, he found that it had firmly reunited. Another time he would perform the operation which had been proposed and carried out in a good many cases by Dr. Hodgen, of St. Louis, viz., to expose the nerve *in* the dental canal and to withdraw a good length of it. Nerve-stretching did good in many cases, but when the inferior dental nerve was affected it did not offer much prospect of success. The nerve made a sharp turn upwards and outwards at the mental foramen, and was, moreover, pretty firmly attached to the bone by fibrous tissue ; it was, therefore, almost impossible to stretch it effectually. The loss of this nerve was of so little account that he should certainly prefer the greater certainty of Dr. Hodgen's operation. He had met with two patients who had lost the inferior dental nerve from syphilitic disease, and they did not appear to suffer any inconvenience whatever.

Mr. SEWILL said he could not agree with Mr. Tomes when he said that the loss of the inferior dental nerve caused no inconvenience to the patient. He had been consulted by an elderly gentleman who was suffering from local neuralgia, owing to a fibrous growth which pressed upon this nerve, and he complained of very great inconvenience ; he was constantly biting his lip, and owing to the absence of sensation was not aware that he had done so until swelling of the lip resulted, and seriously interfered with mastication. Mr. Sewill had also heard of cases in which nerve-stretching had done no good ; for instance, he remembered a case in which Mr. Lister had stretched every nerve of the brachial plexus with a negative result, but he had never heard of a case in which the operation had done harm : he thought, therefore, that it was always worth a trial in any really obstinate case of neuralgia.

Mr. WHITE, of Norwich, said he also had known patients to complain seriously of the inconvenience resulting from loss of sensation in the parts supplied by the inferior dental nerve. Some twenty years ago he removed a lower wisdom tooth, and the operation was immediately followed by loss of sensation of the lip on the same side. This continued for six months ; at the end of which time sensation returned, but soon became exaggerated, and this condition of hyperæsthesia still persisted.

Mr. S. J. HUTCHINSON said, that according to his experience the chief seat of the pain in cases of facial neuralgia was much more often referred to a spot near the angle of the jaw or about the eye, than to the region supplied by the terminal branches of the inferior dental nerve. In the case of the pain being seated near the angle of the jaw, what part of the nerve should be stretched ?

Mr. CHAS. TOMES said his remarks appeared to have been somewhat misunderstood. He had not intended to advocate division of nerve trunks as an infallible cure : he knew that the result of this operation was notoriously uncertain, but he thought that in some cases, as in neuralgia affecting the inferior dental nerve, it offered a better chance of success than the stretching ; it was the best thing to do because nothing better could be suggested.

Dr. H. C. BLANVELT, of New York, said he had assisted at several operations of this kind in America. He could only then call to mind the particulars of four cases. These were, a case of stretching of the sciatic nerve for obstinate sciatica, with a good result ; one of stretching of the inferior dental at the mental foramen for severe facial neuralgia, with good result ; a stretching of the ulnar nerve, also successful ; and another case of stretching of the sciatic, which was not successful. Four months afterwards the nerve was cut down upon again and well stretched a second time, but again without any good effect. This, then, was the only unsuccessful case out of the four.

The PRESIDENT having called upon the author of the paper for his reply,

Mr. A. S. UNDERWOOD said that Mr. Coleman's explanation of the good effect that often followed extraction of teeth in these cases was certainly ingenious, and might be the correct one; but this improvement was seldom more than temporary, and patients had generally lost all their teeth before they could be induced to submit to any cutting operation. With regard to Mr. Tomes's want of success, it was just possible that he had not used sufficient force. Mr. Simmington, in a paper on Nerve-stretching read before the Chirurgical Society of Edinburgh, related some experiments which he had made with the view of ascertaining what amount of force might be applied to nerves without fear of breakage. He found that the sciatic nerve of a strong man would bear a weight of 186 lb., and that of a delicate girl 80 lb., without giving way. Mr. Holden had indeed related a case in which the brachial nerve had been torn across in an attempt to reduce a dislocation of the arm of long standing, but in that instance very great force was used. It was impossible to rupture a nerve by any ordinary amount of force, and it was important that a sufficient amount should be used to make a successful result as sure as possible. It was well, also, not to pull the nerve in one direction only, but, if possible, in several, so as thoroughly to loosen its fibrous connections. An unsuccessful case of Professor Lister's had been mentioned, but it must be remembered that he had previously had very good results from the operation.

In answer to Mr. Hutchinson, he might say that the facial nerve was always stretched at its point of exit from one of the foramina-mental or infra-orbital, and good results might follow even though the seat of pain might be referred to a point higher up.

It was difficult to judge from the published records of the relative value of stretching and of the division of nerves, but he thought that the loss of sensation which must follow the latter operation must always be more or less of an inconvenience, and

that therefore stretching should be tried first, and section kept as a last resource.

The PRESIDENT then proposed that a vote of thanks should be given to Mr. A. S. Underwood for his paper, and to the other members who had contributed specimens and communications that evening. This was unanimously agreed to,

And the Meeting terminated.

## ORDINARY MONTHLY MEETING.

*June 7th, 1880.*

ALFRED J. WOODHOUSE, Esq., PRESIDENT, IN THE CHAIR.

---

THE Minutes of the previous Meeting were read and confirmed.

THE PRESIDENT announced that Mr. Charles Vincent Cotterill, of Rochester, had been proposed for election, and would be balloted for at a subsequent meeting.

MR. LEONARD MATHESON, of Oxford-road, Manchester, was balloted for and elected a Non-Resident Member.

Dr. WALKER read the following notes of a case of Hæmorrhagic Diathesis :—

A. W., aged 38, a night watchman, came before Dr. Walker, at the Westminster Hospital, on the 3rd of March last. He stated that he had always bled a good deal from slight wounds or cuts, as in shaving. When a boy he used to be subject to profuse epistaxis, frequently bleeding until he fainted; had not suffered in this way since he was 15. Neither father nor mother was disposed to hæmorrhages. One brother was liable to epistaxis. Father believed to be syphilitic.

When 19 years of age patient had left upper second molar extracted; it was broken. He was laid up for a month after the operation on account of hæmorrhage; the actual cautery was applied. When 33 years of age the left upper first molar was extracted at St. Thomas's Hospital; it, also, was broken. After the operation bleeding occurred at intervals for seven

weeks; he was treated as an in-patient for five weeks. Perchloride of iron, but in solution and in crystals, was used, and the actual cautery was applied seven times. For six or eight months after leaving the hospital the patient continued to be subject to occasional hæmorrhage, and sometimes it was very free, lasting for two or three hours at a stretch; there had been slight bleeding at times until quite recently.

During the night of Feb. 27th a kind of tumour formed on the gum, at the seat of the extraction. The gum felt sore, and there was some pain and tenderness over the left side of the face and upper part of the neck, but most marked below the eye and just in front of the ear. No deep-seated pain in the ear.

When the patient was seen by Dr. Walker the tumour was found projecting in front of the wisdom-tooth; it was dark-coloured, rather soft, and about the size of a cherry. Mr. Pearce Gould, who also examined the patient, remarked on its resemblance to a myeloid epulis. Next day the swelling burst, and "about a cupful of blood and matter" escaped; the bleeding soon ceased.

The patient was again seen by Dr. Walker on the 10th; all that then remained of the tumour was some shrivelled mucous membrane and blot-clots. Dr. Walker extracted a fang of the second molar, which had been left behind, and the wisdom-tooth; the latter was carious, and its fangs were partly absorbed and very rough, and continuous bleeding occurred for hours, and only controlled by plugging. Patient was admitted into the hospital, the sockets were plugged with cotton-wool soaked with Liq. Ferr. Perchlor., and he was ordered ice to suck. There was but little bleeding during the day; early next morning it broke out again, but was checked by the insertion of fresh plugs and did not return. On the 16th he was allowed ordinary diet, and was made an out-patient a few days afterwards. He attended several times, but was not again troubled with the hæmorrhage.

Mr. CHARTERS WHITE said that this case confirmed him in an opinion he had formed long since, that perchloride of iron

was a most inefficient remedy for arresting hæmorrhage. He had often found it so in his own practice, and had heard the same remark made by others. He now always used Richardson's Styptic Colloid, which he found very effectual.

The PRESIDENT said he quite agreed that the styptic colloid was one of the best remedies for the arrest of hæmorrhage which had yet been discovered. With regard to Dr. Walker's patient, he thought that probably the recurrent hæmorrhage treated at St. Thomas's Hospital came from the dental vessels of the roots which had been left, and, so long as they were in the gum, it was impossible properly to get to the seat of the bleeding.

The SECRETARY showed a flask, of very ingenious but simple construction, made by Mr. Bedmore, of Exeter; the lid was made to slide in a groove, and was fixed by a wedge.

Mr. PERCY MAY showed a model of the upper jaw of a patient, aged 18, which presented the following peculiarities:—The temporary incisors had been extracted at 10 years of age. A year or two later a couple of supernumerary teeth made their appearance, occupying the position of the left central incisor; and then, a few months ago, a very peculiar tooth, stated by Mr. Charles Tomes to be an odontome, came through in the place of the right central incisor. Mr. May removed these three abnormal productions to make room for the two permanent incisors, which were now just in process of eruption.

The PRESIDENT then called upon Mr. E. Canton to read his paper.

*On the Relation of Carious Teeth to Functional Derangements.* By EDWIN CANTON, F.R.C.S.

MR. PRESIDENT AND GENTLEMEN,

I HAVE first of all to thank you for allowing me to make my communication to the Society in a less formal manner than is, I believe, customary. I have not composed an elaborate paper, but propose simply to relate to you briefly an account of certain instructive cases which have come before me in the course of my practice, and to make such remarks and suggestions as may occur to me as I proceed. I think you will find that these cases illustrate some interesting points with regard to the relation of carious teeth to certain diseases, or functional derangements of other parts of the body which are not generally supposed to have any such connection; and I have reason to know that some of these points of relationship are, if not absolutely novel, yet certainly not recognised or appreciated as they should be by the majority of members of the medical profession. For instance, it is, of course, well known that imperfect mastication of food

is a common cause of diarrhœa, but few medical practitioners appear to be aware that habitual constipation is not unfrequently due to this cause. Yet I could relate many examples of this. Thus, a gentleman, aged 40, was brought to me by his medical attendant, who supposed him to be the subject of disease of the rectum. The patient suffered from most obstinate constipation: the bowels never acted except under the stimulus of strong purgative medicine, and even after a free evacuation he had always a feeling "as if something had been left behind." I examined his rectum, but could find no evidence of disease, and then, going at once to his antipodes, I examined his teeth. Those of the upper jaw were good and complete in number, but he had lost his lower molars on both sides; the upper teeth were, therefore, useless for want of antagonists. I recommended that the patient should be fitted with a lower denture: this was done, the patient needed no more purging, and the symptoms of stricture of the rectum completely disappeared.

A lady, about 40 years of age, pale and thin, was brought to me on account of a supposed enlargement of the spleen. Her husband, who had evidently been reading up the subject, wanted to know if she was not suffering from leucocythæmia. She had, indeed, a large tumour on

the left side of the abdomen ; but careful examination showed clearly that this was not an enlarged spleen, but an enormous accumulation of fæces in the descending colon, and on cross-examining the patient I learnt that some fulness had first appeared on the right side, and had gradually travelled across the upper part of the abdomen, increasing as it went, until it reached the position in which I found it. This lady had suffered from dyspepsia for years, and on examining her mouth I found that the state of her teeth rendered the proper performance of mastication an impossibility. I recommended first a course of purgative medicine, and then a set of artificial teeth. So solid was the mass that the purgatives produced for some time but little effect, and the medical attendant had to empty the rectum with a spoon, removing a quantity of hard scybalæ, which, as he said, “fell like brick-bats on the floor.” Eventually the patient made a good recovery.

One of the symptoms which this lady complained of was a feeling of numbness down the left leg, due to the pressure of the hard mass of fæces in the sigmoid flexure and rectum on the origin of the sciatic nerve. And this leads me to remark that bad teeth, imperfect mastication, and consequent constipation is a chain of causes which frequently gives rise to sciatica ; and the

fact that the rectum crosses the origin of the left sciatic nerve accounts for another fact, viz., that sciatica is most common on that side. In such cases I am in the habit of prescribing the following pills:—℞ Calomelanos, gr. x; ol. Crotonis, gtt. i; micæ panis, q. s.—m. ft. pil. ii. The second to be taken seven or eight hours after the first. A very common result of this treatment is to bring away a large quantity of fæces, even though no accumulation had previously been suspected. And in these cases it will generally be found that faulty mastication is the real cause of the disease; the purge will *relieve* the patient for the time, but the only permanent *cure* is a good set of teeth.

The following case illustrates another possible effect of the same causes:—I was asked to see a gentleman, living at Brixton, who was suffering from severe spasms of the muscles of the right leg. He had consulted me some years previously on account of troublesome constipation, and I had ordered him pills which completely relieved him. He had been in the habit of walking to his place of business in the City; then as the spasms began to trouble him he was obliged to ride; and at last they became so bad that his leg was quite useless, and he was compelled to give up business altogether. I found that the muscles affected were those of the front

and inner part of the thigh, with the extensor of the fascia lata. His general health was good; he had no symptoms of spinal disease, though he was under treatment for it, and the spasms were confined to the muscles supplied by the anterior crural nerve. This induced me to search for some local cause, and I soon found a dull, hard mass in the right iliac fossa; the cause of the mischief was an accumulation of fæcal matter in the cæcum, which pressed upon the trunk of the anterior crural nerve. The patient, thinking himself cured of his constipation, had discontinued taking his pills, and this accumulation of fæces had been the result. I put him on a course of purgative medicine, and he at once began to pass large quantities of solid fæces. It took some weeks before the collection was entirely removed, but as the colon was gradually emptied the spasms diminished in severity, and finally ceased altogether. This patient also had no molar teeth, and herein lay the real cause of his troubles.

In the following case the exact line of connection between the cause and effect was not so clear, but that there was a connection cannot be doubted:—One of my patients sent her servant to me—a woman of 35 years of age—who complained of dull, aching pain in the left ankle. I could find nothing wrong locally, but

the patient had been getting thin, had suffered for some time from dyspepsia, and *she had very bad teeth*; the molars, particularly, were all decayed, and some of them reduced to “stumps.” I refused to order her any medicine, but told her to get a set of teeth. At first she paid no attention to my advice, but a short time afterwards called again to say she was convinced that I was right. She had some tough steak for dinner one day, which gave her an acute attack of indigestion, and at the same time the pain in her ankle became very severe, although previously to the meat she had none. She then got the teeth, became fat and strong, and has had no trouble since.

It is, in fact, scarcely possible to exaggerate the importance of proper mastication of the food. It should be reduced by the teeth to a complete pulp, and unless so reduced the digestion is sure to be deranged and general lowering of health will follow. The imperfectly digested mass, which passes through the pylorus, does not take up a proper amount of bile—Nature’s purgative,—and the consequences which I have just been describing follow as a matter of course.

I have said that imperfect mastication always causes more or less general impairment of nutrition: this is sometimes very marked; the

patient continues for some time thin and weak, and at last falls an easy victim to any illness by which he may be attacked. In women this low state of general nutrition greatly predisposes to barrenness. A young lady was brought to me by her husband; she had been married for some time, but had no family. She was thin, "nervous," had no appetite, suffered from indigestion when she did eat, was restless at night, and had bad dreams. I asked her if she masticated her food properly, and she answered, "Oh yes"; but, on looking into her mouth, I found that her teeth were very badly decayed. I recommended the supply of molar teeth; they were adapted, the lady got stout and strong, soon became pregnant, and eventually had several children. So marked was the improvement in her health, and so evident the connection between this and the subsequent pregnancies, that when the husband paid me an occasional visit, and I asked after his wife, he used to answer, "Oh, she is quite well, thank you, Mr. Canton, *she does not want any more teeth!*"

Another case was that of a gentleman, aged 45, who had been treated by several physicians and was said to be suffering from "atrophy." When he came to me he was so miserably weak and wasted as to have all the appearance of a dying man. Yet, after a very careful examination,

I could find no evidence of any specific disease, but I did find that the state of his teeth was such that he could not possibly masticate. I therefore told him that all he wanted was a good set of teeth. He then said that he had made arrangements for a trip to New York, and that as American dentists had a great reputation for cleverness he would have some teeth made there. I did not see him for a few years, and when he revisited me he had become a healthy man. He had been to New York, had taken no more medicine, but had obtained the teeth, and simply by the help of these and careful attention to diet had quite recovered his health.

Before I conclude, I should like to give my testimony in confirmation of the views expressed by Dr. Brunton in the paper which he recently read before this Society. I have no doubt whatever as to the powerful influence of dental irritation in producing derangements of the nervous system. Not long since, a strong, healthy-looking young man, aged 19, came to me stating that he had lately become subject to epileptic fits. It struck me that the fits might possibly be due to the cutting of his wisdom-teeth, since the cause of the seizures inscrutable to his medical advisers, and on looking into his mouth I found that all had appeared except one, which was just struggling to come through. I laid bare

the crown by a free crucial incision and kept it exposed. The fits never recurred.

About four months ago a young lady was brought to me by her father; she was suffering from almost complete paralysis of the left leg, and could not walk without the assistance of a stick. She had no symptoms of disease of the brain or of the spine, but her left lower wisdom-tooth was only half through the gum. She had been under the care of several eminent surgeons and physicians, but who, unable to detect a cause, had not examined into the state of her teeth. On making inquiries, I learnt that the tooth had given her pain for three years past, and that feebleness of the leg commenced at the same time. The patient did not continue under my care, so I had no opportunity of ascertaining whether my suspicions as to the cause of the paralysis were well founded; but we know that paralysis from teething is not very uncommon in children,\* and that similar results do occur, though rarely during the eruption of the per-

\* As an example of this, Mr. Canton brought forward a little girl, 4 years of age, and very intelligent, who laboured under partial paralysis of the left arm and leg, which appeared during the cutting of the temporary teeth. She was subject during this time to convulsions of a very severe character, accompanied by coma and strabismus. The insensibility lasted for many hours. The child's general health was now very good, but the paralysis persisted in spite of careful and prolonged medical treatment.

manent teeth. This lady is now under the care of a surgeon who considers her paralysis to be of spinal origin, and she has been consigned to a "Sayer's jacket" for twelve months.

In conclusion, I have only to thank you for your patient attention, and trust you will consider that the cases I have brought forward convey some useful practical lessons.

The PRESIDENT, after thanking Mr. Canton, in the name of the Society, for his very suggestive paper, remarked that as Mr. Mummery was about to read a paper on a somewhat similar subject, he thought it would be better to postpone the discussion of Mr. Canton's very interesting series of cases until that had been read, and then to discuss the two papers together. He would therefore at once call upon Mr. Mummery to read his paper.

*A Remarkable Case of Strabismus and Blanching of the Hair, arising from a Diseased Tooth; with additional Instances of Nervous Disorders arising from Dental Irritation. By J. R. MUMMERY.*

MR. PRESIDENT AND GENTLEMEN,

THE attention of the Society has been occupied, at some recent meetings, with the consideration of remote nervous affections originating in diseases of the teeth. Having been unable to be present on those occasions, I take this opportunity of bringing before the Society, notes of a very interesting case of strabismus and blanching of the hair, which resulted from a remarkable form of disease in two molar teeth.

I have also selected a few other cases from the list of those I have recorded during a lengthened professional experience, in further illustration of the subject.

In the month of January, 1878, I was consulted by a young lady who suffered acute neuralgic pain

on the left side of the face. I learned that some months previously, in a distant part of the kingdom, the left first upper molar had been filled, at its distal surface, with amalgam. Much pain and discomfort had ensued, and when I saw the patient, severe lancinating pain was felt throughout the ramifications of the fifth nerve, especially in the temporal region; and the motor branches were so seriously involved that the left eye was drawn towards the outer angle of the orbit, and the pupil was entirely hidden from view.

I removed the stopping, and, finding the pulp exposed, I applied arsenious acid, and cleared out the roots. On the following day a considerable amount of relief was experienced; but no alteration had taken place in the position of the eye. I reluctantly extracted the tooth, and on the fourth day the pain had nearly disappeared, and the eye had perfectly recovered its natural position. The illness of a relative compelled my patient to leave London in the following week; but in the month of November she returned to town, when I found that all the symptoms had returned with increased severity. I had detected on the former occasion a small cavity on the mesial surface of the second molar, and filled it temporarily with Hill's stopping, with a view to treating the case effectually, which was prevented by the young lady's sudden departure from London.

When I again saw my patient, the left eye was completely closed, and on raising the upper eyelid the peripheral margin of the iris could alone be seen.

The patient's hair, of a dark brown colour, had become blanched on the left temple to the extent of fully two inches in diameter, and the neuralgic suffering was intensely aggravated.

I removed the tooth without delay, and by the fourth day the eye had regained its normal appearance; the pain also gradually disappeared. On splitting open the tooth, the roots presented a very remarkable condition. The pulp of the palatal root appeared to have become extensively hypertrophied (the wall of that root being proportionally absorbed), and this portion of the pulp afterwards to have become calcified, from the apex of the root to its contact with the still living coronal pulp,—which, with the pulp of the buccal roots, was highly congested, and bled on being punctured. I have never met with a case in which similar conditions existed, and am inclined to attribute the severity of the symptoms to the pressure of the calcified pulp upon the living portion, and to the peculiar state of constriction which existed, in the absence of any external aperture in the affected tooth. I have received a report of the patient's state of health within the last week, and am informed that no

return of strabismus or of neuralgic pain had been experienced since her last visit, but that the blanched patch of hair had not in the slightest degree recovered its pigment.

In the year 1871, a lady who was suffering agonizing pain in the right ear, accompanied by absolute deafness on that side, was referred to me by her medical attendant,—all the usual treatment having failed even to mitigate the pain. On examination of the mouth, I found the lower third molar on the right side extensively decayed, and the dental pulp quite decomposed.

The tooth was removed, with some little difficulty, the apex of the agglutinated roots being abruptly turned towards the ramus. The tooth was liberated by turning it in a backward direction, and within twenty-four hours the pain had disappeared. The functions of the ear were fully restored within the month following the operation.

A gentleman, of tall stature and good physical development (but painfully emaciated and depressed, owing to want of sleep through constant suffering in the nerves of the face and head) consulted me some years since.

The pain was restricted to the left side. Every remedy that medical skill could suggest had been employed in vain, and he had obtained sleep only by the use of narcotics for more than four months.

He possessed a remarkably fine set of teeth, and more than one examination had led to the conclusion that the pain could not have its origin in teeth, which were apparently so free from caries; and after a careful examination I was inclined to the same opinion.

I proceeded, however, to explore the left side with a fine probe, but could discover no sign of caries. I then carefully polished the left canine and incisors, as the patient felt a slight sensation on percussion in those teeth only; and on placing him in full sunlight, and reflecting a ray of light upon those teeth from the mirror placed within the mouth, I detected a very slight opacity on the distal side of the lateral incisor; but the teeth were so closely impacted that no probe could reach the place of the suspected caries. The canine was inclined forwards, and impinged forcibly on the distal surface of the lateral incisor. On extracting the tooth I found, at the circumscribed point where the teeth crossed each other, a very minute cavity, exposing the pulp. The patient experienced immediate and permanent relief.

I have no doubt that cases such as I have referred to are familiar to my audience, and I will now recount the particulars of some cases in which severe reflex disturbance arose from the pressure of perfectly sound teeth.

A young lady, aged 22, applied to me respecting incipient caries on the grinding surface of a lower molar,—the only tooth that exhibited any sign of caries. The cavity proved very superficial, and it was filled with gold, causing no inconvenience. Observing that the lady was wrapped in an unusual number of shawls, &c., I learned that she had for a long time been under treatment for rheumatism, and, among other remedial agents, had often visited German baths without obtaining any relief. I accordingly inquired respecting the seat of her pain, and learned that intermittent paroxysms were felt throughout the ramifications of the fifth pair of nerves; that a peculiar sensation was felt when pressure was made over the spinous processes of the cervical vertebræ; and that, in addition to pains in the neck and shoulders, there existed a great sense of weariness and loss of power in the arms.

On examining the third molars in the lower jaw, I found them imperfectly erupted through want of space, and that the upper corresponding teeth were obliquely directed towards the buccal side of the arch. Believing that the impacted position of these teeth had originated her sufferings, I advised their removal, and the four wisdom teeth were extracted. I found no trace of caries in either of the four teeth; but the roots of the lower teeth were curved in the direction

of the ramus, and, like those of the upper teeth, of unusual length.

Within a few weeks, every trace of the supposed rheumatic affection had totally disappeared.

A young lady whose teeth had been for several years under my care had always appeared healthy and of a cheerful disposition. At the age of sixteen, she became subject to severe headaches, was depressed in spirits, and very taciturn. She complained of a feeling of pressure in both upper and lower teeth, accompanied by a dull continuous pain. As her teeth were perfectly free from caries, but very closely impacted, I judged that the advancing wisdom teeth bore some relation to her suffering. On passing a sharp probe through the gum, I could feel the contact of the instrument with the deeply-imbedded crown of the tooth in each instance. Repeated lancing gave no relief; and at seventeen the patient became subject to occasional epileptic attacks, causing great anxiety to her family. As the case had become so urgent, and it was impossible to reach the wisdom teeth, I decided to extract all four of the sound second molars. No attack has occurred since the operation, which took place four years ago, and the patient has quite recovered her health and cheerfulness. In due time, the third molars were fully erupted, and are, to this day, perfectly free from decay.

Some years ago, a gentleman of vigorous frame, aged about twenty-eight, consulted me respecting severe neuralgic pain in the left side of the head and face. The pain appeared to originate in the first upper molar, which showed no sign of caries, but the peridental membrane was evidently the seat of the pain. After trying other remedies, I removed the tooth and found the roots considerably exostosed, the disease taking the form of a minutely granular deposit, which covered nearly the whole of the fangs. The only explanation of the case that I can suggest is that he acknowledged that he was accustomed to crack hard substances with his teeth, and as exceptionally severe work is naturally allotted to the first molar, I conclude that repeated concussions had set up the mischief in an otherwise perfectly sound set of teeth.

About twenty-six years since, I saw a gentleman of gouty diathesis, who had for a long time suffered intense pain on the left side of the face and head, which no remedial measures could relieve. His teeth were free from caries, but the first molar was slightly displaced from its socket. I removed the tooth, and found the roots completely imbedded in an exostosed mass, larger than any that has come under my notice. I sent the tooth to Mr. Tomes, and, with the kind consent of Mr. Charles Tomes, I have borrowed

it from the Museum of our Society. The patient speedily lost all trace of the pain, and when I recently saw him he had attained the age of eighty-one, having entirely escaped recurrence of his former suffering.

Without citing other cases, I consider that there is sufficient ground for assuming that dental diseases were the source of all these various evils.

In conclusion, I think we may venture to hope that the accumulated testimony of so many observers regarding the reflex morbid influence of diseases of the teeth will serve a practically beneficial purpose. A clearer light may be thrown upon obscure cases, which have baffled all the skill of able medical practitioners in their efforts to relieve suffering.

Before resuming my seat, Mr. President, I will, with your permission, make a brief reference to a curiously absurd clerical error in the tables appended to a paper which I read before this Society in 1869. A few weeks ago, Mr. Oakley Coles remarked to me that his measurement of the maxillary arch did not agree with mine. Remembering what great care I had taken in recording all the data from which those tables were compiled, I was not a little surprised to find that the width of the dental arch was stated at two inches, and varying fractions of a third inch. I certainly never found a dental arch that

approached three inches on the palatal side of the molars, and it must be evident to all that a race so endowed would rank with the sons of Anak.

The error is easily accounted for. In the voluminous notes which recorded the dental conditions of the over 1,700 skulls in the list, I did not insert the figure 1, but only the fractions of a second inch. As the adjoining column commenced with the figure 2, the column recording the width of arch was accidentally headed with the same figure 2 by my amanuensis.

The most remarkable circumstance is that, although the paper has been quoted by several authors, and has led to extensive correspondence, with the accumulation of much interesting and valuable information on the subject, to a large extent serving to confirm my views; yet the error in the tables had hitherto escaped notice, and I am indebted to Mr. Oakley Coles for the discovery of the accidental error.

## DISCUSSION.

The PRESIDENT, after thanking Mr. Mummery for his interesting paper, invited Dr. Bellisario, if he had sufficiently recovered from the fatigues of his journey, to address the meeting. He felt sure that Dr. Bellisario, from his large experience, would at least be able to illustrate the subject by some instructive cases.

Dr. BELLISARIO (of Sydney) said he could confirm Mr. Canton's suspicions as to the cause of the paralysis of the leg which he had spoken of by relating the following case :—A young lady, aged 25, came to him complaining of severe pain on the right side of the jaw, and stated also that her right arm had been paralysed for seven months. She had tried various remedies for the neuralgia, but without benefit. She had a very fine set of teeth, but the right lower wisdom-tooth was absent, and on exploring with a sharp-pointed probe, Dr. Bellisario found that the tooth was lying horizontally in the jaw, the crown being impacted against the second molar. Having got the patient under chloroform, he cut away a piece of the outer plate of the maxilla, and with some difficulty removed a large wisdom-tooth. The patient was at once relieved of her pain, and gradually recovered the use of her arm.

Mr. E. MOORE asked Mr. Canton at what age he thought it might be advisable to supply artificial teeth. It was not an uncommon thing to meet with children of 12 to 14 years of age whose molars were quite useless to them : did Mr. Canton think it advisable to supply teeth at so early an age ?

Mr. F. CANTON mentioned the case of a clergyman who had been sent to him by his medical attendant to be supplied with a set of teeth. The patient, who was quite edentulous, had suffered much from dyspepsia. The teeth were fitted, and

the patient, at his next visit, declared himself much better, although he could not eat with the teeth. The explanation seemed to be that the mere presence of the plates had caused a greatly increased flow of saliva, and that this had facilitated digestion.

Mr. STORER BENNETT asked whether Mr. Canton could give any further information as to the effects of treatment in the case of the young lady with paralysis of the leg.

Mr. GEORGE PEDLEY remarked that the "bolting" of food caused deranged digestion in two ways; for the movement of the jaws in mastication, besides effecting the thorough pounding of the food, also greatly increased the flow of saliva, and this was a very important factor in perfect digestion.

The PRESIDENT remarked that probably few people were aware how large a quantity of saliva was poured out during a meal. A patient of his had the misfortune to have one of his parotid ducts wounded during an operation for the removal of a tumour from the cheek, and a fistulous opening had resulted. In this case two napkins would be saturated during dinner by part of the secretion of one salivary gland, for a portion still entered the mouth by the natural channel.

Dr. WALKER said he had met with several cases of very severe neuralgia due to exostoses on the roots of apparently sound teeth. One gentleman, who had been employed as a surveyor in Spain, had suffered intensely for three years, and, when he came to Dr. Walker, was very thin and ill in consequence. Four upper molars were extracted, all extensively exostosed, and the patient was entirely relieved. Another case was that of a girl, aged nineteen, who had to be carried into his room on account of partial paraplegia. He extracted several teeth, and she recovered and remained well for three months. She then had severe pain on the right side of the face. Dr. Walker extracted a stump, which was found to be exostosed; the patient had no more pain, got quite strong, and afterwards married.

Mr. MUMMERY asked whether any one could throw any light on the pathology of the case of strabismus and blanching of the hair which he had related. The state of the pulp cavity was very remarkable: he had not been able to find a similar case recorded in any work with which he was acquainted.

Dr. BELLISARIO said that the only case at all resembling it which had come under his notice was that of an Indian officer, who was visiting Sydney on furlough. He came to him complaining of severe pain on the right side of the face, which was ultimately referred to a lower molar. But on proceeding to extract it, Dr. Bellisario found that it was split down the centre. The patient could not account for the tooth being broken, and on examination it was found that the pulp was completely calcified. Dr. Bellisario believed that it had been split by the pressure of the calcifying mass within.

Mr. CANTON, in reply to the questions put to him, said that he could not give any age at which it might not in some cases be desirable to supply artificial teeth; it depended on the fact whether or no any other means could be found to supply the want. As to the young lady with the paralysed leg, the case was scarcely within the scope of his practice, and therefore he did not undertake the treatment. He believed, however, that she still remained in much the same state; the tooth had not been removed, and the disease was said to be spinal.

The PRESIDENT then proposed a vote of thanks to the authors of the papers and casual communications. This having been carried unanimously, the President reminded the members that this was the last meeting of the session, and expressed a hope that before they met again they would all have benefited by a well-earned and well-enjoyed holiday.

The meeting then terminated.

# INDEX.

---

## A

- ACCOUNTS, Statement of, for the year ending Oct. 31, 1879, 57.
- Acids, action of, upon cements, 32.
- Address on assuming office by the new President (Mr. Alfred Woodhouse), 79.
- Address, valedictory, by the President (Mr. Edwin Saunders), 61.
- Alveolo-dental periosteum in teeth, 7.
- American dental instruments, 18.
- Apparatus for regulating teeth, 214.
- Arch, maxillary, error in tables relating to, 260.
- Arsenic, action of, 12, 17.
- Artificial teeth, difficulty in swallowing caused by, 28.
- Ash's rock cement chemically examined, 22.

## B.

- BALANCE-SHEET for 1879-80, 57.
- Balkwill, Mr., on observations made of the upper jaw, 194; illustrations of his meaning, 195.

- Barrett, Mr. Ashley, his experience of drawing teeth into line, 55.
- Bellisario, Dr. (Sydney): paralysis caused through a wisdom-tooth, 262; case cited, *ib.*; severe pain on right side of face caused through lower molar, 264; molar split down the centre, *ib.*; calcification of pulp, *ib.*
- Bennett, Mr. F. J., nominated, 51; elected, 139.
- Bennett, Mr. Storer, on misapplication of terms, 100; treatment of paralysis of the leg, 263.
- Betts, Mr. E. G., admitted member, 27.
- Blanvelt, Dr. H. C., on the stretching of nerves, 236.
- British Journal of Dental Science* on "Cystic Disease of the Upper Maxilla," 2.
- Brunton, Dr. Lauder, on nervous diseases connected with the teeth, 144-170; opinions and experience of Mr. Woodhouse, 171; questions and opinions of Mr. Tomes *ib.*; Mr. Sewill, 172-3; Mr. Coleman, Mr. Gaddes, 174; Mr. Oakley Coles, Dr. Walker, 175:

a member, 176; questions of Mr. F. Canton, 176; Mr. J. S. Turner, 177; Mr. Dennant, 177; questions of Mr. S. J. Hutchinson, 178; replies, 178, 179.

## C.

CALCIFICATION of pulp, 7, 264.

Canton, Mr. E.: case of difficulty in swallowing, caused by artificial teeth, 28; nature of remedy, 29; gold bar ulcerating under tongue, 30; presented the jaw of a cat to the museum, 212; on certain instructive cases; relation of carious teeth to certain diseases, &c., 242-251; opinions of Dr. Bellisario (of Sydney), 262, 264; questions of Mr. E. Moore, *ib.*; Mr. F. Canton, *ib.*; question of Mr. Storer Bennett, 263; Mr. George Pedley, *ib.*; Mr. A. Woodhouse, *ib.*; Dr. Walker, *ib.* (see Mr. Mummery's paper, 252); replies, 264.

Canton, Mr. F., presence of plates causing increased flow of saliva, 263

Carious teeth successfully replaced by old dead teeth, 16.

Carter, Mr. T. S., proposed for election, 211.

Cases, various instructive, with remarks and suggestions, communicated by Mr. E. Canton, 242-251; relation of carious teeth to certain diseases, 242; diarrhoea caused by imperfect mastication, 242; habitual constipation also due to same cause, 243; cases cited, 243-249; patient fitted with lower denture, 243; supposed enlargement of the spleen, *ib.*; tumour on left side of ab-

domen, 244; accumulation of fæces in the descending colon, *ib.*; fulness on patient's right side, *ib.*; impossibility of performing mastication, *ib.*; numbness in left leg, *ib.*; bad teeth, imperfect mastication, and consequent constipation giving rise to sciatica, *ib.*; name of pills prescribed, 245; result of his treatment, *ib.*; faulty mastication real cause of disease, *ib.*; cure found in a good set of teeth, *ib.*; severe spasms of muscles, *ib.*; presence of dull hardness in right iliac fossa, 246; accumulation of fæcal matter in the cæcum, *ib.*; spasms diminishing in severity, *ib.*; patient with no molar teeth, *ib.*; dull aching pain in patient's left ankle, *ib.*; molars decayed and reduced to "stumps," 247; indigestion caused through bad teeth, *ib.*; necessity of proper mastication, *ib.*; powerful influence of dental irritation in producing derangements of the nervous system, 249; epileptic fits caused through cutting wisdom-teeth, *ib.*; paralysis from teething not uncommon, 250.

Clements, Mr. Thos., elected resident member, 1; admitted, 27.

Coate, Mr. Herbert: nominated, 27; elected, 98.

Cobbold, Dr.: on measurements of palates, 199; cases cited, 199, 200; shape and form of the superior maxillary and palate bones, 201.

Coleman, Mr.: exhibited an odontome, 2; explanation of same, *ib.*; on certain conditions of dead teeth, 15; the use of arsenic

in curing periodontitis, *ib.*; wisdom teeth, 49; epilepsy occasionally caused by dental irritation, 188; the case of a prisoner at Millbank, 189; on nerve-stretching in neuralgia, 234.

Coles, Mr. Oakley, on deformities of the upper jaw, 103-135; remarks by Mr. A. Woodhouse, Mr. West, Dr. Walker, Mr. J. S. Turner, 136; discussion adjourned, 137; resumed, 190; opinions of the President, *ib.*; Dr. Walker, *ib.*; Mr. Balkwill, of Plymouth, 194; Mr. Sewill, 196; Mr. Tomes, 201; replies, 206; on epilepsy and dental irritation, 189; withdrawal of his criticism, 212; presented a set of models illustrating deformity of upper jaw, 189.

Committee, report of, on plastic fillings, 20-26.

Communications read: By Mr. C. S. Tomes, on certain conditions of dead teeth, 4; by Prof. W. H. Flower, on the specimens of abnormal dentition in the museum of the Royal College of Surgeons, 32; by Mr. Oakley Coles, on the deformities of the upper jaw, 103; by Mr. T. Lauder Brunton, on nervous diseases connected with the teeth, 144; by Mr. A. S. Underwood, on nerve-stretching in neuralgia, 217; by Mr. E. Canton, on instructive cases showing the relation of carious teeth to certain diseases, &c., 242-251; by Mr. J. R. Mummery, on a remarkable case of strabismus and blanching of the hair, arising from a diseased tooth, with additional instances of nervous dis-

orders arising from dental irritation, 252-261.

Cotterill, Mr. C. V., proposed for election, 239.

Cotton-wool and creosote for root-filling, 17.

Crapper, Mr., on osseous union and transposition of two teeth, 214; on specimen of salivary calculus, 215; a celluloid plate, cases of continuous gum work, blocks, and old plate, presented to the Museum by, 216.

# D.

DEAD teeth: certain conditions of, communicated by Mr. C. S. Tomes, 4-14; treatment of, 4-12; all but dead in their outer epithelial layer, the enamel, 5; partial absorption of roots, 6; continuity with the rest of the organism by two channels, 7; curious condition of an upper molar, 8; root of an upper lateral eaten away, 9; two conditions to combat in dead teeth,—abscess at apex of root, and general disease of periosteum, 10; what becomes of protoplasmic contents of dentinal tubes when pulp is removed? 11; effect of arsenic, *ib.*; shellac for filling roots, 13; roots more perfectly filled with shellac, 14; with gutta-percha, 15; implanted into sockets, 16; stopping, 17; artificial, 28; temporary, 30; permanent, *ib.*

Deformities of the upper jaw, communicated by Mr. Oakley Coles, 103; works dealing with this and allied subjects, *ib.*; his use of the triangle, 105; average length of skulls, 109; measurements of the

- normal palate, 110; illustrations of meaning, 114-120, 123, 125; adjourned discussion, 190-209.
- Dennant, Mr., on abnormal dentition, 50; case cited, *ib.*
- Dental chair, improved, 54.
- Dentition, abnormal: specimens of, communicated by Prof. W. H. Flower, 32-47; 1,100 crania examined, 33; irregularities as to the number of teeth; excess of normal number, 33; cases cited, 33, 34; deficiency in number, 34; cases cited, 35; retention of permanent teeth within the alveolus, 36; incisor teeth, 37; canine teeth, *ib.*; cases cited, 37-38; retention of the premolars, 39; various cases, 39-40; abnormal position of individual teeth considered, 40; various facts, 40-43; dentition of animals, 43; cases cited, 44-47.
- Dewes, Mr. H. W., elected to membership, 181.
- Discussions: on certain conditions of dead teeth, 15; on specimens of abnormal dentition, 48; on deformities of the upper jaw, 136; adjourned discussion, 190; on nervous diseases connected with the teeth, 171, 262; on nerve-stretching in neuralgia, 234.
- Dyspepsia caused through imperfect mastication, 244.

## E.

- ELLIOTT, Mr. W. St. G., nominated, 27; elected, 98; admitted, 181.
- Ewbank, Mr. Francis, nominated, 1; elected, 28; admitted, 98.
- Exhibits: by Mr. Coleman, an odontome, 2; by Mr. Woodhouse, casts of Mr. Cohen's mouth, 3;

by Mr. C. S. Tomes, an upper molar, 8; an upper lateral, 9; by Mr. Vanderpant, a first lower molar with an exostosis on the root, 30; a curious old bone plate, 31; by Mr. Hutchinson, a curiously-formed wisdom tooth, *ib.*; useful "chucks" for lathes, *ib.*; a curious photograph, *ib.* (see plate opposite page 139); by the Secretary, model from Mr. W. H. Skeet, of Omara, 51; model of the mouth of a patient, 212; simple and ingenious flask, 241; by Mr. R. H. Woodhouse, skull of native of New Caledonia, 52; a sequestrum from lower jaw of a woman, 98; by Mr. S. J. Hutchinson, plate and four models of upper and lower jaw, 54; a plate worn four years without removal, 216; by Mr. J. S. Turner, extraordinarily-shaped canine, 102; by Mr. Magor, small deformed wisdom-tooth, 143; by Mr. Harding, model of an irregular case, 213; by Mr. Moon, an apparatus for regulating teeth, 214; by Mr. Vanderpant, a specimen of osseous union and transposition of two teeth, 214; a large mass of salivary calculus, 215; sent by Mr. Crapper, a celluloid plate, some cases of continuous gum work, blocks, and curious old plate, 216; by Mr. Percy May, model of a patient's upper jaw, 241.

## F.

- FARNSWORTH, Mr. Charles, elected to membership, 139.
- Field, Dr., treatment of dead teeth, 17; projection of upper teeth, 55.

Financial statement of the treasurer, 57.

Fletcher's dental porcelain chemically examined, 20-22; dry chloride of zinc, 22; white enamel, 24.

Flower, Prof. W. H., on the specimens of abnormal dentition in the museum of the Royal College of Surgeons, 32-47; opinions of the President, Mr. C. Tomes, 48; Dr. Walker, Mr. Coleman, 49; questions of Mr. Henry, 50; Mr. Vasey, Mr. Dennant, *ib.*; questions of Mr. Hutchinson, 51; Mr. Mummary, *ib.*; replies, *ib.*

Forsyth, Mr., appointed scrutineer, 51.

#### G.

GADDES, Mr., criticism of Mr. Tomes' communication on certain conditions of dead teeth, 15, 16; appointed scrutineer, 51; on the influence of nervous system, 142.

Gibbings, Mr., nominated auditor, 52.

Gutta-percha fillings, 213.

#### H.

HÆMORRHAGE, arresting, 241; case of hæmorrhagic diathesis communicated by Dr. Walker, 23.

Hammond, Mr. W. P., proposed for election, 211.

Harding, Mr. W. E.: case of a boy's right central incisor projected above level of other teeth, 99; its description, *ib.*; on the insertion of gutta-percha fillings, 213; method of using, *ib.*; case irregularity, *ib.*

Harrison, Mr. William A., portrait, facing page 27.

Harding, Mr. W. P., proposed for election, 212.

Hardy, Mr. T., nominated auditor, 52.

Henry, Mr., on abnormal dentition, 50.

Henry, Mr. Martin, nominated, 27; elected, 98; admitted, 181.

Hepburn, Mr. David, case of central incisor fractured by fall on ice, 101.

Hugo, Mr. G. J., nominated, 98; elected, 181.

Hugo, Mr. Maurice, nominated, 98; elected, 181.

Huet, Mr., presented to the Museum two specimens of gemmated teeth, 2; nominated non-resident member, 27.

Hughes, Mr. H. W., nominated, 98.

Hutchinson, Mr.: on calcification of teeth, 16; an epitome of his visit to America, 18; his visit to eight dental colleges, &c., *ib.*; exhibition of curiously-deformed wisdom-tooth, 31; "chucks" for lathes, *ib.*; a curious Hindoo photograph, *ib.*; abnormal dentition of teeth, 51; retention of lower temporary molars and canines, 52; case cited, *ib.*; on improved dental chair, 54.

Hutchinson, Mr. S. J.: exhibition of plate and model of upper and lower jaw, 54, 55; description of case, *ib.*; replies, *ib.*; exhibition of plate encrusted with salivary calculus, 216; pain in cases of facial neuralgia, 236.

#### I.

#### ILLUSTRATIONS:—

Portrait of Mr. Arnold Rogers, facing page 27.

*Illustrations continued:—*

Portrait of Mr. Wm. A. Harrison, facing page 79.

*Deformities of Upper Jaw.*—Triangle measurements, 114-120, 123, 125. Fig. 1, outline of upper jaw; fig. 2, section through fig. 1, *a b*; fig. 3, section through fig. 1, *c d*, 195.

Photograph, curious, representing a group of monkeys extracting a man's tooth, facing page 139

Incisor, right central, projected above level of other teeth, 99.

Instruments, dental, American, 18

Iszlai, Mr. Joseph, elected to membership, 139.

## J.

JAW, cat's, presented to Museum, 212

Jaw: dolichoid (long), 114; brachoid (short), 115; macroid, (large), 117; microid (short), 119; intermaxillary prognathism, 120; intermaxillary upognathism, 123; lambdoid, 125.

Jaw, upper: deformities of, 103-135; discussion on, 190-209; models of, presented to Museum, 52, 189

Jawbone, divided, case of, 53.

## L.

LIBRARIAN: report of, for the year 1879-80, 59; vote of thanks to, 77.

## M.

MAGGS, Mr. W. A., nominated, 51; elected, 139; admitted, 181.

Magor, Mr.: deformed left upper wisdom-tooth presented to the Museum, 143.

Mason, Mr. Brown: right central incisor broken by a billiard-ball, 102; case of patient striking upper incisors on stone step, 143; description of his operation, 143.

Mastication, importance of, 247.

Matheson, Mr. Leonard, elected non-resident member, 239.

May, Mr. Percy: exhibited model of peculiar upper jaw, 241; case of odontome appearing in place of the right central incisor, *ib.*

Measurement of maxillary arch, error in tables of, 260

Mersom, Mr. James, admitted to membership, 139.

Moon, Mr.: exhibition of apparatus for regulating teeth, 214

Moore, Mr. E., at what age should artificial teeth be supplied? 262.

Mummery, Mr.: presented to the Museum two skulls of Australian blacks, 2; abnormal dentition, 51; on a case of strabismus and blanching of the hair, with instances of nervous disorders arising from dental irritation, 252-261; opinion of Dr. Bellisario, 264.

## N.

NERVE-STRETCHING in neuralgia, communicated by Mr. A. S. Underwood, 217-233; severe cases of neuralgia, 217; causes of, 218; cured radically by nerve-stretching, *ib.*; three cases, 219-224; nerve-stretching in thirty-nine cases, 224; no harm caused through stretching nerves, 224; neuralgia a vascular phenomenon, 226; circumstances necessitating nerve-

stretching, 228; discovery of the operation, 228; wonderful facts, 231; list of cases of nerve-stretching, 232, 233.

Neuralgia, nerve-stretching in, 217-233.

Noble, Mr. Chas. Jas.: elected resident member, 1; admitted, 98.

Normal palate, measurement of the, 110.

O.

ODONTOME exhibited, 2.

P.

PARKINSON, Mr., financial report and statement of deaths, resignations, new members, &c., 56-59.

Parkinson, Mr. G. W.: nominated, 1; elected, 28; admitted, 51.

Pedley, Mr. Geo, nominated, 52; elected, 139; admitted, 181; deranged digestion caused by "bolting" food, 263.

Perchloride of iron, Mr. Charters White's opinion on, for arresting hæmorrhage, 241.

Pike, Mr. J. L. F. J., nominated non-resident member, 27.

Plastic fillings, report of sub-committee on, 20.

Poulson's cement chemically examined, 21; mineral plombe, 25.

President: address valedictory of (Mr. Edwin Saunders, 1879-80), 61; custom of annual election, 62, 63; retrospect of the session by, 64; thanks to, 77; inaugural address of (Mr. Alfred Woodhouse, 1880-1), 79; review of the profession, 80-85; Odontological Society first established, 85-87; College of Dentists first

established, 87; amalgamation of the two societies, 89; introduction of Bill into Parliament, 92; general particulars, 93-97.

R.

READ, Mr. Lawrence: nominated, 98; elected, 181.

Redding, Mr., presented skull of native of New Caledonia, 52.

Report of Sub-Committee on plastic fillings, 20-26; chemist's report of experiments—chemical examination of dental cements—Fletcher's dental porcelain, mixed of consistency convenient for use, 20; Poulson's cement, 21; Fletcher's dental porcelain, mixed as thickly as possibly, *ib.*; ditto, of convenient thickness; ditto, mixed very soft; Fletcher's dry chloride of zinc (white enamel), 22, 24, 27; Ash's rock cement, *ib.*; action of acids upon the cements, *ib.*; Poulson's mineral plombe, 25; Slayton's cohesive felt foil 25; individual experience of committee, 26.

Roberts, Mr. T. A., admitted to membership, 51.

Rogers, Mr. Arnold (third president of the Society), portrait, facing page 27.

Rogers, Mr. Claude, fixed lower plate, 53; case cited, *ib.*

S.

SALIVA, flow of, 263.

Salivary calculus, specimen of, 215.

Saunders, Mr. Edwin (president, 1879), case of five incisors in the upper jaw, 48; an improved dental chair, 54; valedictory address as President, 61.

Secretaries, votes of thanks to, 77.

Sewill, Mr.: criticisms on Dr.

Walker's opinions with regard to the passage of pus, 141, 142; rarity of epilepsy due to diseased teeth, 182; opinions of various authorities:—Dr. Gowers, Dr. Sieveking, and Dr. Hughlings Jackson, 183; Dr. Ferrier, 184; Dr. Buzzard, 184, 187; case of epilepsy and facial neuralgia, 185-187; the term, "dental aura," 189; protest against particular words used by Mr. Coles, 197; scientific statements of Mr. Coles, 198; an intractable case of epilepsy, 212; on nerve-stretching in neuralgia, 235.

Shellac for root-fillings, 13, 14; opinions of Mr. Tomes on, 17.

Skeet, Mr. W. H. (Omara), absorption of upper jaw, 51; model accompanying communication, *ib.*; description of case, 52.

Slayton's cohesive felt foil, 25.

Smale, Mr. M. A.: nominated resident member, 27; elected, 98; admitted, 211.

Statistics of deaths, resignations, memberships lapsed, and new members elected during 1878-9, 58.

Strabismus and blanching of the hair arising from a diseased tooth, case of, with additional instances of nervous disorders arising from dental irritation, communicated by Mr. J. R. Mummery, 252-261; neuralgic pain on the left side of face, 253; case cited, *ib.*; left first upper molar filled with amalgam, *ib.*; lancinating pain felt throughout the ramifications

of fifth nerve, *ib.*; patient's eye drawn towards the outer angle of the orbit, pupil being hidden from view, *ib.*; arsenious acid applied, *ib.*; tooth extracted, *ib.*; cavity on the mesial surface of second molar, *ib.*; extraction of second molar, *ib.*; patient's eye completely closed, 254; blanching of hair, *ib.*; remarkable condition of roots, *ib.*; calcification of pulp, &c., *ib.*; pain in the right ear and absolute deafness, 255; case cited, *ib.*; lower third molar extensively decayed, *ib.*; dental pulp decomposed, *ib.*; suffering in nerves of face and head, *ib.*; case cited, *ib.*; opacity on the distal side of lateral incisor, 256; exposure of pulp, *ib.*; incipient caries on the grinding surface of a lower molar, 257; third molars imperfectly erupted, *ib.*; impacted position of teeth, *ib.*; extraction of four wisdom-teeth, *ib.*; pressure in upper and lower teeth, 258; four second molars extracted, *ib.*; neuralgic pain originating in first upper molar, 259; case cited, *ib.*; roots of a first molar imbedded in an exostosed mass, *ib.*; various evils caused by dental diseases, 260.

Styptic colloid, Richardson's, for arresting hæmorrhage, 241.

## T.

TAMWORTH, Mr. Chas., nominated, 51.

Taylor, Mr. Adam (India): nominated, 1; elected, 28.

Taylor, Mr. Arthur: nominated, 52; elected, 139.

Teeth, dead: treatment of, 4, 10, 12; opinions of Mr. Coleman, 15; Mr. Field, 17; pulp retaining little or no vascularity, 6; partial absorption of roots, *ib.*; rendered pulpless by calcification of pulps, 7; action of arsenic, 9; filling roots with shellac, 13; American instruments, 18; difficulty in swallowing caused by artificial, 28; rare case of temporary, 30; curiously-formed wisdom-tooth, 31; supernumerary, 33, 34; interesting specimens of, 35; retention of permanent within the alveolus, 36; cases of incisor and canine, 37-39; retention of the premolars, 39; specimens among animals, 43-47; remarkable wisdom, 53; incisor projected above level of other, 99; nervous diseases connected with the, communicated by Mr. T. L. Brunton, 144-170; toothache, 144; headache through toothache, 145; connection between dental caries and neuralgia, 150; deafness consequent on dental irritation, 155; blindness resulting from dental decay, 155; Magendie's opinions, 157-159; eyesight affected, 160; other consequences, 161-9; Mr. Sewill's opinion on the paper, 172; are epileptic fits caused by carious? 175, 181-189; regulation of a patient's, 212; osseous union and transposition of two, 214; removal of a lady's, 234; a broken left upper second molar extracted, 239; a left upper first molar extracted, *ib.*; tumour projecting in front of wisdom-tooth, 240; fang of a second molar extracted

*ib.*; wisdom-tooth extracted, *ib.*; sockets plugged with cotton-wool soaked with liq. ferr. perchlor, *ib.*; use of Richardson's styptic colloid for arresting hæmorrhage, 241; recurrent hæmorrhage from dental vessels of roots, *ib.*; temporary incisors extracted, *ib.*; supernumerary, *ib.*; odontome tooth in place of right central incisor, *ib.*; two permanent incisors in process of eruption, *ib.*; on relation to carious, to certain diseases, &c., communicated by Mr. E. Canton, 242-251; loss of lower molars, 243; state of, rendering mastication impossible, 244; patient with no molar, 246; decayed, 247; indigestion caused through bad, *ib.*; use of good, 249; cutting wisdom, *ib.*; probable paralysis from, 250; strabismus and blanching of the hair resulting from disease in two molar, 252; application of arsenious acid, 253; remarkable condition of roots, 254; third molar decayed and dental pulp decomposed, 255; exposed pulp, 256; incipient caries on surface of a lower molar, 257; impacted position of teeth, *ib.*; four wisdom, extracted, 257; pressure in upper and lower, 258; cracking nuts with, 259; roots imbedded in an exostosed mass, *ib.*; important correction of an error in a previous paper (1869), 260.

Thompson, Mr. F. W.: nominated resident member, 27; elected, 98; admitted, 181.

Tod, Mr.: case of extra molar, 212; model presented to Museum, *ib.*

Tomes, Mr. Charles, on certain

conditions of dead teeth, 4-14; opinions and questions of Mr. Coleman, Mr. Gaddes, 15; Mr. Hutchinson, 16; Dr. Field, 17; replies, *ib.*; on abnormal dentition, 48; stunted teeth, 49; on contributions to Museum, 60; criticism of Mr. Cole's paper on deformities of the upper jaw, 202; on the interbicuspoid measurement, 202; misapplication of terms, 203; intermaxillary prognathism, 204; case of severe neuralgia, 234, 236.

Treasurer, financial statement of, for 1879-80, 57; vote of thanks to, 77.

#### U.

UNDERWOOD, Mr. A. S., on nerve-stretching in neuralgia, 217-233; opinions of Mr. Coleman, Mr. C. Tomes, 234-236; Mr. Sewill, 235; Mr. White, Mr. S. J. Hutchinson, 236; Dr. H. C. Blanvelt, 236; replies, 237.

Upper jaw, deformities of the, 103-135.

#### V.

VANDERPANT, Mr., exhibited specimen of osseous union and transposition of two teeth, 214; description of same, *ib.*; exhibited a lower plate encrusted with mass of salivary calculus, 215; exhibited another plate, 216.

Vasey, Mr., wisdom-teeth, 50.

Viseck, Mr. Baxter, nominated resident member, 27; elected, 98; admitted, 181.

Vote of thanks to sub-committee for report on plastic fillings, 26;

to retiring president (Mr. Edwin Saunders), 77; to secretaries, treasurer, and librarian, *ib.*; to authors of papers, &c., 264.

#### W.

WALKER, Dr., his knowledge of Mr. Cohen, a swindler, 3; case of young lady with ten temporary teeth in upper and same number in lower jaw, 30; on abnormal dentition, 49; case cited, *ib.*; on probable duration of a swelling in the maxillary region, 140; presence of pus in the orbit, 142; epilepsy caused by dental irritation, 188; criticism of Mr. Coles's paper on deformities of the upper jaw, 190-194; notes of a case of hæmorrhagic diathesis, 239; use of liq. ferr. perchlor. for hæmorrhage, *ib.*; severe neuralgia due to exostoses on roots of apparently sound teeth, 263; cases cited, 263.

Waller, Mr. Robert, Cairo, elected corresponding member, 1.

Weiss, Mr., satisfactory state of library, 59; an aperture in an incisor, 101.

White, Mr.: condition of hyperæsthesia, 236; perchloride of iron inefficient for arresting hæmorrhage, 241; Richardson's styptic colloid, *ib.*

Woodhouse, Mr. (president, 1880-1), description of a swindler, 2; casts of his mouth, 3; exhibited skull of a native of New Caledonia, 52; specimens of wisdom-teeth, 53; inaugural address as president, 79-97 (see President); ex-

hibited a sequestrum from lower jaw of a woman, 98; description of same, 99; on communication with the pulp cavity, 100; on deformities of the upper jaw, 190; on extra molar spoken of by Mr. Tod, of Brighton, 212; on bicuspid moving considerable distances, 213; a useful appara-

tus, 214; styptic colloid the best remedy for arrest of hæmorrhage, 241; recurrent hæmorrhage proceeding from dental vessels of roots, *ib.*; quantity of saliva poured out during a meal, 263; case cited, *ib.*

Woodruffe, Mr. W. H., admitted to membership, 51.

---

## INDEX TO PLATES.

---

Photograph of a Hindoo bas-relief, representing a group of monkeys engaged in extracting a man's tooth.

Portrait of ARNOLD ROGERS, Esq., F.R.C.S.Eng., L.D.S. Eng.

Portrait of WILLIAM A. HARRISON, Esq., F.R.C.S. Eng., L.D.S. Eng.

---

WYMAN AND SONS, PRINTERS, GREAT QUEEN STREET, LONDON.















